LinkTADs

D3.4 Workshop proceedings and conclusions, propositions to set up new research projects

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D3.4

Workshop proceedings and conclusions, propositions to set up new research projects

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01.

Workshop Summary

Objectives of the workshop

As a part of tasks of WP3, CAHEC organised a workshop on 9-10 April 2015 in Qingdao, China, based on D3.2 recommendations. The objectives of this workshop were to propose collaborations between EU and Chinese partners on epidemiology and laboratory research, and to develop new research projects aimed to fill the main knowledge gaps on top 8 emerging infectious diseases (EIDs) and transboundary animal diseases (TADs) which were identified as priorities to both the EU and China by LinkTADs partners, such as avian influenza (AI), bovine tuberculosis (bTB), classical swine fever (CSF), African swine fever (ASF), antimicrobial resistance (AMR), porcine reproductive and respiratory syndrome (PRRS), Japanese encephalitis (JE) and peste des petites ruminants (PPR).

Overview of the workshop

During the two-day workshop, 43 participants including scientists, experts and researchers from research institutions and the industry attended the workshop. They originated from five Chinese institutions, three European institutions, and one Industry Company. With respect to the gender distribution, 15 participants were female (ca. 35% of participants).

The two-day meeting was structured as a highly interactive workshop, with all the time dedicated to develop the framework of research project proposals targeting the eight priority diseases. 15 speakers presented key presentations on the animal disease epidemiological situation in the EU and China. Sixteen participants participated in group discussions.

All the participants could choose to join any of the eight discussion groups based on their interests. Discussions took place in parallel in two separate meeting rooms, with two diseases discussed at the same time. Each disease session had two facilitators, one from the EU, one from China. After discussions, each group prepared their discussion summary and presented to the bigger group.

Dr. Wang Shushuang, deputy general director of CAHEC, gave the welcome address, introducing the objectives of the workshop and extended thanks to the partners for their efforts to make the workshop happen. Dr. Wang Youming from CAHEC chaired the opening session, and Dr. Kang Jingli gave the closing remarks.

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02.

Discussion Summary

Discussion overview

Discussion sessions were the core of this workshop. Each disease session lasted about three hours and followed a pre-defined structure. Each session started with a 20-minute introductory presentation covering the disease background, its epidemiological situation in EU and China, the current research, prevention and control programs, and the main gaps that need to be addressed. The discussion session that followed used participatory methods to promote interaction between participants on the following topics:

- the identification of potential research topics;
- its grouping under a small number of research objectives;
- the ranking of these objectives (by proportionate piling) according to their perceived importance;
- the definition of the activities and steps needed to complete each selected objective;
- the identification of all relevant partners (including potential external partners);
- The identification of grants that could be targeted to fund these projects.

Discussion step

Each discussion session included the following six steps.

1. Disease presentation [30 min]

The presentations had to include:

- Aetiology;
- Epidemiological situation in the world (where relevant);
- Epidemiological situation in China;
- State-of-the-art of the research;
    - Laboratory research;
    - Epidemiology research;
- Potential knowledge gaps.

2. Define the objectives of potential research projects [20 min]

Each participant wrote on different pieces of paper up to three research needs that he/she considered important. All papers were returned to the facilitator, who then read them aloud and put them on a wall board. The facilitator classified these needs under a small number of research objectives (between 3 and 8) to help the subsequent discussions. These objectives were considered as the work packages (WP) of the potential future projects.

3. Rank the different objective headings according to their priority [30 min]

Participants were asked to agree on splitting 100 coins between the different objective headings according to their perceived priority. Extensive discussions took place. The facilitator made sure that the discussions stayed focused and that everyone had a chance to speak. Once a consensus was reached, the three or four most important research objectives were selected for further discussions.

4. Define the activities that are necessary to complete the objectives [40 min]

Participants were allocated to one objective (creating 3 groups of 3-4 persons). They were asked to identify the different steps needed to achieve the objectives, and rank them if necessary. Discussions were promoted by the facilitators in each group in no more than 15 minutes. Then, each group presented to the other groups the rationale for implementing these steps. Based on the discussion with the other two sub-groups, these steps could be modified.

5. Other activities [20 min]

The facilitator promoted discussions amongst participants in order to:

- Identify all relevant partners (they do not have to be present at the meeting);
- Identify potential grants that could be targeted to fund these projects.

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03.

Concept Note Summary

Concept notes summary

As a result of this workshop, seven concept notes (one per disease) and one project sheet were finalized:

- The project sheet summarises the main aspects of a newly funded project between SHVRI, CIRAD and SVA. This project, funded by the Chinese ministry of science and technology, is a major outcome of the LinkTADs project since it associates a Chinese laboratory (SHVRI), an EU laboratory (SVA) and a European epidemiology group (CIRAD) that met thanks to LinkTADs.
- The concept notes will hopefully lead to development of more detailed project proposals and to the implementation of new projects where both LinkTADs and external partners can collaborate beyond the life-span of LinkTADs, addressing the major research gaps identified during the workshop and beyond.

The following concept notes and project overview were developed:

1. AI concept note;
2. bTB concept note;
3. PPR concept note;
4. ASF concept note;
5. CSF concept note;
6. PRRS concept note;
7. AMR concept note;
8. JE project overview.

1. AI concept note

Tentative title of the project

Improving AIV control and surveillance in China

Project overview

- **Summary of the situation of the disease in the region of interest**

China has been considered an important epicenter for the emergence of new avian influenza virus (AIV) strains and an area of high risk for emergence of human pandemic strains for decades. Various AIV subtypes have emerged in China and spread regionally and internationally over the last decade, including zoonotic subtypes such as H5N1, H9N2 or H7N9. Over the last years, several new highly pathogenic AIV (HPAI) of the H5 subtype have emerged in China and spread to Asia (H5N3), North America (H5N2) and both North America and Europe (H5N1 and H5N8).

These later viruses that spread to North America and Europe were detected in both domestic poultry and wild birds, raising the question of the route of transmission from Asia and the potential role of wild migratory birds, in particular wild ducks reservoir of low pathogenic AIV (LPAI), in the spread of these viruses. Areas of intensive rice cropping in south China offer high-density interfaces between wild and free-grazing domestic ducks. These interfaces increase the contacts between wild and domestic ducks and may facilitate the emergence and spread of new AIV subtypes. Prevention measures based on a modification of agricultural practices may be implemented in these areas to reduce the intensity of AIV transmission between wild and domestic ducks. This would require involving all local stakeholders to discuss feasible and acceptable solutions.

Following the emergence of a new subtype, live bird markets have been suggested to play an important role in its spread. In a recent study following the emergence of the zoonotic H7N9 LPAI virus in China, the local density of live-poultry markets was the most important predictor of H7N9 infection risk in markets, underscoring their key role in the spatial epidemiology of H7N9, alongside other poultry, land cover and anthropogenic predictor variables. Targeting prevention and control measures on key live bird market may be a cost-effective solution to stop the spread of AIV. Studying the value chains including these live bird markets may help to identify these key markets and propose control measures that would be accepted by the different actors.

- **Main knowledge gaps, challenges and research questions**

To improve AIV surveillance and control in China, we need to further study two key systems: the wild-domestic duck interface, key to the emergence of new subtypes, and the poultry value chain, key to the spread and maintenance of AIVs.

Data collected during surveillance programs may already be available and could be used for further epidemiological analyses. One important challenge would be the collating and the analysis of these data along with information about the sampling framework used for their collection. Ideally, such analysis would be conducted by Chinese scientists, with the technical support of international experts in epidemiology. Addressing this challenge would be the first step of our EU-China project and it would allow (i) improving the design of the current surveillance programs, (ii) the generation of hypotheses about the epidemiology of AIVs, and, finally, (iii) the design of studies aiming to investigate the wild-domestic duck interface and the poultry value chain.

Regarding the wild-domestic duck interface, important knowledge gaps are the drivers of the spill-over from wild to domestic ducks and in particular the agricultural practices facilitating these AIV exchanges. Social and economic studies aiming to understand the perception of AIV by duck farmers and to assess the acceptability of various prevention measures should be implemented.

Regarding the poultry value chain, we should focus on describing and analyzing the structure of the network resulting from the trade of live poultry, and how this structure impacts the spread and maintenance of AIVs. This would help to identify key markets (key live bird markets for example) where prevention and control measures should be implemented as a priority. This knowledge would also help to trace back the source of infection detected in markets to the farming systems. In addition, social science studies should be conducted in order to assess the feasibility of control measures (e.g. market closure, market rest days), and their acceptability by the different actors, so that poultry trade doesn't shift to alternative mechanisms leading to illegal trade and facilitating AIV spread.

- **Proposed study**

Project structure

We propose two steps:

1) Collating and analysis of already existing data

National surveillance data are potentially available at CADC. This first step would consist in checking the availability of these data, collating them in a comprehensive way and analyzing them with advanced epidemiological methods.

2) Wild-domestic duck Interface and poultry value chain studies

Based on the results from the first step, complementary protocols will be implemented in order to collect missing data about the following topics:

For poultry value chains:

- Network structure, virus spread dynamics, surveillance and control
- Phylogeny of AIV strains circulating in the value chains
- Socio-economic aspects of poultry value chains

At the wild-domestic duck interface:

- Virus spread dynamics, surveillance and control
- Phylogeny of AIV strains circulating at the interface
- Socio-economic aspects of free-grazing duck farming

Materials and methods (for each component/activity)

Material for the first step will be the existing data collated.

Depending on the nature of the data collected, different epidemiological methods will be used such as multivariate analysis and spatial statistical modeling

Protocols for the second step will be dependent on the results of the first step and will be detailed later in the project.

Expected results

The first step results should provide an overview of the epidemiological situation at the wild-domestic duck interface and along the poultry value chains.

Project Timeline

The first step should be implemented as soon as possible. One year could be allowed to collate the data and process them.

This could then lead to a longer project of 3 to 4 years for the second step.

Expected budget

The first step requires little budget and can be implemented thanks to already existing actions such as LinkTADs.

List of partners involved and responsibilities

- CADC, responsible for the data collection in the first step
- RVC and CAHEC, responsible for the epidemiological analysis of the already existing data and responsible for the poultry value chain study
- CIRAD and Fudan University, responsible for the wild-domestic duck interface study

Potential funding and grants where to apply for the proposed project

For the first step of the project (collating and analysis of existing data):

Scholarship to fund a Chinese-based scientist, supervised by CADC/CAHEC/RVC (Inc. advanced training in epidemiological statistical modelling in the UK).

EU (Trade project) and FAO contributions

For the first step of the project

- EU (2020)
- Welcome Trust
- NIH
- 13th 5-year national Chinese plan, submission to MoA
- Gates foundation
- Chinese epidemiological investigations
- National Chinese Research Foundation

2. bTB concept note

Tentative title of the project

Improving bovine TB control and surveillance in China

Project overview

- **Summary of the situation of the disease in the region of interest**

Tuberculosis (TB) is an important chronic bacterial zoonosis caused by *Mycobacterium tuberculosis* complex (MTBX). The main pathogens in MTBX are *Mycobacterium tuberculosis* (*M. tb*) and *Mycobacterium bovis* (*M. bovis*). *M. tb* mainly causes human TB, while *M. bovis* has a large range of hosts including cattle, deer, badgers, etc. Besides, *M. bovis* could cause human TB either.

China has been considered to be the 2nd in 22 high TB-burden countries in the world. The transmission of bovine TB (bTB) between animals (especially dairy cattle) and humans is one of the major causes of human TB. Therefore the surveillance and control of bovine TB in animals are of primary relevance for control of human TB.

The general strategy to control bovine TB in animals is the policy of detection-slaughter, which means to cull all the positive animals. Theoretically, this is the most effective approach. However, this strategy leads to a high economic burden in developing countries due to the high price of cattle and the lack of adapted compensation strategies. Besides, it is difficult to implement this policy for the wild animals.

Generally speaking, the developing countries usually compensate the culled animals (mainly cattle) with an amount quite lower than their market price. Therefore the farmers/enterprisers would be reluctant to disclose the prevalence of bTB in their animal herds. Meanwhile, the local government would not be happy either to take on this economic burden. Due to above reasons, the prevalence of bTB in animals especially dairy cattle in China is seriously underestimated. Meanwhile the detection technology needs to be improved in the specificity, sensitivity, and simplicity with the affordable price.

- **Main knowledge gaps, challenges and research questions**

To improve bTB surveillance and control in China, we need to further study five systems: surveillance, control, diagnostic method development, transmission routes, and economics of bTB. Ideally, such programs would be conducted by Chinese scientists, with the technical support of international experts in epidemiology.

Since bTB is listed in class B as a notifiable disease in China, a national and regional bTB surveillance programme is implemented, but the real prevalence in the whole population remains largely unknown due to the reasons described above. Meanwhile, surveillance of the wild animals has not started systemically.

Control of bTB is beneficial for the health of both animals and humans. Technically, control of bTB is complex, involving cost-effective and realistic surveillance and intervention strategies based on sound epidemiological knowledge of bTB, a high specific and sensitive diagnostic methods, known transmission routes which can be blocked effectively. However, we meet with challenge in each of these factors.

The accurate diagnosis of bTB is very critical to successfully implement the policy of detection-slaughter. The conventional skin test has its innate disadvantages such as being time- and labor-consuming, and highly non-specific. The blood based assay kits such as IFN-γ in vitro release assay kit from the international market are very expensive and unaffordable for routine diagnostic procedures in China. Therefore, it is necessary to develop novel diagnosis kit by Chinese scientists under the technical support of international experts.

Transmission routes of bTB are critical to bTB control. They include the transmission among the animals, between animals (mainly cattle) and humans, and between domestic animals and wild animals. Currently, there are some reports related to bTB in different species and humans. However, the transmission routes are largely unknown.

The economics of bTB surveillance and intervention is important for bTB control. The cost is usually addressed, but the benefits of the surveillance and control strategies are largely unknown. The main reason is the decrease of bTB cases in humans due to the widely use of pasteurized milk products. Therefore it is necessary to evaluate the benefit and cost of the bTB control plan in current situation. The results will provide the critical evidence to make bTB control plan and take all the essential measures to control bTB.

The most challenge for these programs would be the data collection due to the reasons described as above.

- **Proposed study**

Project structure

We propose to structure the project in 5 sections:

Surveillance of bTB

(1)Prevalence estimation

The target species is dairy cattle, including

Smallholder farms in Inner Mongolia/Heilongjiang (and Hubei province)

Commercial farms in Inner Mongolia/Heilongjiang (and Hubei province)

Inner Mongolia and Heilongjiang provinces have been selected because of they are the main milk producing regions in China

(2) Genotyping in both humans and animals

The isolated strains in human hospitals in Inner Mongolia/Heilongjiang to estimate the proportion of M. bovis amongst TB cases

The isolated strains from cattle in Inner Mongolia/Heilongjiang to estimate the proportion of M. bovis and M.tb in positive cattle

Control of bTB

(1) Gap analysis of the current mitigation strategy

Animal identification and trace system

(2) Modelling the transmission of bTB and testing different alternative mitigation strategies (Policy makers need to be involved in the definition of alternative mitigation strategies)

(3) Compliance to pre-movement testing requirements

- Retrospective study
- Field survey with questionnaire
- Influence of changing the compensation scheme on farmers' reporting behaviours

(4） Recommendations for carcass/organs disposal

- What are the practices on farm, in abattoir (meat inspection?)
- Review of what is being done in other countries

Diagnostic techniques

(1) Sharing experience on testing strategies with international experts

Serial testing? Parallel testing? Which tests?

(2) Develop an IFN-g test cheaper and more effective

(3)Twinning project between HZAU and UK

- Exchange of students/staffs
- Capacity building and knowledge transfer between HZAU and provincial laboratories

Transmission routes

Conduct a risk analysis using the data collected as part of the first section

- Movement of animals?
- Biosecurity measures (pre-testing, etc.)
- Source of animals?
- Farm characteristic (size, breed, production system, etc.)

Economics of bTB

(1) Incorporation of an economic model to the transmission model developed in the "control" objective to provide economic evidence for informing decisions on mitigation

(2) Estimate the economic impact of bTB in Inner Mongolia/Heilongjiang/Hubei in dairy cattle population based on data collected in the "surveillance" objective, including both animal and public health impact

Funding opportunities

Funding opportunities would include applying for grants from both EU and China based on zoonotic property of bTB.

Partners

- Surveillance

  LinkTADs: CADC, CAHEC, HZAU, FAO, RVC

  External: Massey University, FLI, Spanish lab (national ref lab), social scientists

- Control

  Idem

- Diagnostic

  LinkTADs: CADC, CAHEC, HZAU, FAO, SVRI

  External: APHA (former AHVLA in UK), Spanish lab (national ref lab)

- Transmission routes

  Idem than "surveillance"

- Economics

  Same than "surveillance" + economist (RVC)

3. PPR concept note

Tentative title of the project

Targeted research efforts on peste des petites ruminants in China to support the global eradication plan

Project overview

- **Summary of the situation of the disease in the region of interest**

PPR was first officially reported In the People's Republic of China in the Ngari region of western Tibet in July 2007. Phylogenetic analysis indicated that the Tibet PPRV is classified as lineage IV, and related to strains in India and Bangladesh. The last known outbreaks in Tibet were in 2010.

In 2013, a PPR outbreak occurred in Xinjiang Province in the northwest of China in a village close to the border with Kazakhstan. The PPRV strain was also found to be lineage IV but more closely related to strains from Central Asia, and was therefore likely to be a new introduction rather than spread from Tibet. The disease spread eastwards and southwards causing outbreaks in 22 Provinces in China during January to October 2014.

In 2015 so far there have been four outbreaks in 3 provinces – Hunan, Jiangsu and Jiangxi – all in the east of China. During the 2013-2015 epidemic, there have been at least 37,000 sheep and goats affected of which at least 16,000 have died (43% case fatality).

In order to control the epidemic, infected herds were culled, movement control and closure of live animal markets was introduced at the end of March 2014, and mass vaccination was conducted in most Provinces. A study conducted in April 2014 by CAHEC in two major small ruminant markets in Shandong Province that sourced animals from Xinjiang and Inner Mongolia, indicated that in the previous week, small ruminants had moved from the markets to multiple destinations across southern, eastern and northeastern China. Such movements could have been the cause of the rapid spread of PPR during 2014.

A plan for PPR eradication is being prepared.

- **Main knowledge gaps, challenges and research questions**

- Farmers' and vets' awareness of PPR risk and impact
- Vaccination coverage
- Vaccination practices
- Distribution of the sheep and goat populations
- Live sheep and goat trade patterns
- Effectiveness of the current surveillance and control strategies
- Socio-economic impact of PPR

- Trade adaptation in reaction to the closure of live animal markets following the occurrence of a PPR outbreak
- Transmission routes
- Transmission parameters

- **Proposed study**

Specific objectives

- To improve the effectiveness of PPR surveillance in China
- To evaluate the current PPR vaccination strategy in China
- To describe the sheep and goat value chain in China and assess its impact on the transmission and maintenance of the PPR virus
- To optimize the PPR control strategy in China

Project structure

Component 1: Surveillance of PPR in China

Activity 1: To assess the level of awareness of sheep and goat farmers and veterinarians with regards to the risk and impact of PPR

Activity 2: To collate and use existing surveillance data for better understanding of the epidemiology of PPR in China (risk factors, transmission, and vaccination coverage)

Activity 3: To estimate the level of under-reporting of PPR outbreaks in China and its drivers at different levels (sheep and goat owners, traders, etc.)

Component 2: To describe the sheep and goat value chain in China

Activity 1: To describe and model the spatial distribution of the sheep and goat population and the different production systems

Activity 2: To describe the main flows of sheep and goat movement at country level using existing databases

Activity 3: To identify and map all the different live small ruminant markets in a specific province such as Xinjiang or Inner Mongolia (source provinces)

Activity 4: To describe and analyze the sheep and goat trade network (frequency of movements quantity, origin, destination, etc.) in that specific province and the links to other provinces

Activity 5: To characterize the non-commercial movement patterns (e.g. in nomadic populations)

Activity 6: To explore human behaviour before PPR occurred, during an outbreak, after control measures are implemented, and the current situation

Component 3: To evaluate the current PPR vaccination strategy in China

Activity 1: To evaluate the current vaccination coverage using data collected in the field (serology surveys, interviews of vaccine providers and farmers)

Activity 2: To describe and evaluate the vaccination strategies and practices in the field

Component 4: To optimize the PPR control strategy in China

Activity 1: To estimate the basic reproduction number (R0) of PPR between animals and between farms using field data in a specific province and determine the optimal vaccination coverage

Activity 2: To assess the effectiveness of the current and alternative PPR mitigation strategies (e.g. vaccination, culling, movement restriction, etc.) in the specific province by modelling the transmission of PPR in the trade network under different mitigation strategies

Activity 3: To conduct a cost-benefit analysis of the current and alternative PPR mitigation strategies in the specific province

List of potential partners and responsibilities

- Chinese Animal Health and Epidemiology Centre (CAHEC)
- Chinese Animal Disease Control centre (CADC)
- Provincial Animal Disease Control centers
- Huazhong University
- Chinese Ministry of Agriculture
- Centre de Coopération International en Recherche Agronomique pour le Développement (CIRAD)
- Royal Veterinary College (RVC)
- Food and Agriculture Organization (FAO)

Potential funding and grants where to apply for the proposed project:

Same as the other proposals

4. ASF concept note

Tentative title of the project:

Improving African swine fever (ASF) preparedness in China

Project overview:

- **Summary of the situation of the disease in the region of interest**

As the African swine fever (ASF) situation worsens in many parts of the world, China has become increasingly concerned about the potential introduction of the disease. ASF is one of the most severe and highly contagious viral infections of domestic pigs and wild boar. ASF was restricted to Africa, except for the Italian island of Sardinia, until 2007, when it was reported in Georgia, after being introduced via waste from a ship that had sailed from South-East Africa. It quickly spread across the Caucasus and the Russian Federation, Belarus and Ukraine following trade routes, and eventually reaching the European Union in 2014. The main paths of introduction and further spread of ASF are through informal movements of contaminated pork products, transported for personal consumption or smuggled for trade purposes. In the absence of a vaccine to prevent the disease, the only options available are strict controls of animal and pork movements into the country (particularly informal ones), ensuring preparedness at all levels in the event of an incursion, improving biosecurity measures and raising public awareness.

With the increased circulation of ASF virus worldwide, there is growing global concern that ASF could spread into East Asia from ASF-endemic areas. With China relying heavily on the pork production industry and owning almost half the world's domestic pig population, an incursion of ASF would have a catastrophic impact on trade and pig production, with serious implications for global food security.

The risk of the disease being introduced from Sub-Saharan Africa and Eastern Europe is increasing. The Chinese government has banned the legal import of pigs or pig products from ASF-infected countries, however a large number of informal movements of potentially contaminated pork and other pig products occur through smuggling, inadequate disposal of ship/airline waste, and in travelers' luggage. The ASF virus survives long periods of time in meat and can eventually end up as swill feed for domestic pigs or garbage to which scavenging pigs or wild boar has access.

Human movement between China and ASF-infected countries has increased hugely for two reasons connected to globalization: i) China provides massive labor forces to African development interventions, where the disease is endemic; and ii) it now has the highest number of tourists travelling overseas and returning to China, therefore increasing the risk of importing contaminated meat.

In the event of an incursion of ASF in China, the control of the disease would be further complicated by two facts: i) the largest percentage of pigs comes from small backyard production systems with low biosecurity measures; ii) the well-developed highway system allows for rapid movement of pigs from one province to another. A further knock-on effect of the disease spreading into neighboring countries in Asia would pose a severe economic challenge to the world.

- **Main knowledge gaps, challenges and research questions**

Given the absence of ASF in China, the main knowledge gaps and challenges to China will differ considerably from those animal diseases that are already present in the country. The major knowledge gaps relate to preparedness and surveillance:

Risk Assessment - Improving our understanding of the risks of ASF entry and encroachment in the pig sector and wild boar populations.

Baseline information on hosts – This information is crucial for an effective risk analysis. The distribution and densities of backyard (i.e. low biosecurity settings) and wild boar are largely unknown. These are precisely the populations that are most likely to get infected and the ones where it would be most challenging to implement prevention and control actions. The presence and distribution of Ornithodoros soft ticks, which could play an important role in the establishment of the disease, is similarly unknown.

Surveillance – Surveillance is an expensive endeavor. Targeted surveillance is therefore crucial to minimize sampling/testing costs, while maximizing the chances to detect promptly an ASF incursion. The results of the risk analysis exercise will aid in the developing of more targeted surveillance approaches. Similarly, the concept of syndromic surveillance also needs to be incorporated to the current surveillance strategy.

Vaccine development – Despite the many years of international efforts to develop an effective vaccine against ASF, there is still nothing available on the market and it seems like there will be nothing short-term. Nevertheless, vaccines are important tools in the prevention and control of animal diseases.

Training & Public Awareness – Given the historical absence of ASF in China, awareness on the disease are low at all stakeholder levels (i.e. farmers, butchers, middlemen and other along the pig and pork value chain, hunters and forestry workers, and the veterinary services and diagnostic laboratories).

- **Proposed study**

Specific objectives

Building on the work already conducted by MOA, CAHEC, the FAO/China TCP and other partners, we propose the following objectives and activities:

Objective 1: Risk Assessment

This objective incorporates the gathering of necessary data, and is divided into the following sequential steps/activities:

- Release assessment:

- Gathering of baseline information on movement of live animals, people, products, etc.

Survey of illegal import of meat through airline passengers in an international Chinese airport

Inspection of ships originating from infected areas

Study the movement patterns of people returning from high risk locations (particularly Africa), e.g. whether there are concentrations of where they go to and what proportion go to rural locations.

- Release assessment using the data described above, plus readily available information

- Exposure assessment:

- Gathering of baseline information on host distribution and densities followed by validation in the field:

- Wild boar distribution and densities
- Tick distribution
- Domestic pig distribution by production system (e.g. commercial, backyard, free-ranging)
- Information in a specific area on husbandry and biosecurity practices
- Impact assessment (will the disease spread further, become endemic, etc.?
- Gathering of baseline information on pig movements (in an area at high risk of introduction)

Objective 2: Development of a risk-based surveillance plan

The ultimate objective is to review and adjust the existing ASF surveillance plans according to the results of the risk assessment. Surveillance will be divided into two major categories: surveillance at the port of entry (airports, seaports, and land borders) and at the populations at risk. Specific activities will include:

Develop detailed step-wise protocols for surveillance that will aid in the implementation of surveillance activity at the provincial level (e.g. site selection, # of samples, etc.)

Adaptation, implementation and training on wild boar surveillance techniques (for which it is key to coordinate and collaborate with Forestry authorities). Given the expenses, dangers and logistic challenges

involved when trapping wild boar (and the absence of wild boar hunting in China), efforts will focus on non-invasive sampling techniques.

Tick collection and identification in high-risk areas. Areas with high likelihood of tick presence will be identified using habitat suitability maps followed by the screening of pig sera for the presence of antibodies against tick salivary glands (that would show an interaction between pigs and ticks). Finally, tick collection teams will be trained in the collection and identification of ticks, and deployed for tick collection in the identified high risk areas.

Objective 3: Vaccine development

Given the on-going work by several international institutions and consortiums around the world, the first step will be to explore potential collaborations with existing ASF vaccine research groups (e.g. Pirbright Institute, Universidad Autonoma of Barcelona, Plum Island Animal Disease Centre, International Livestock Research Institute (ILRI), etc.

Objective 4: Public awareness and training

Public awareness and training activities would be implemented at different target groups:

Laboratory training:

Ring test evaluation – CAHEC will be invited to participate at the yearly EU ASF ring tests to ensure the capability of the diagnostic services to identify ASF virus and antibodies in different tissues, at different concentrations, etc.

Linkage with International Reference Laboratories for exchanges, laboratory visits, trainings and the exploration of joint projects

Training of field veterinarians, pig breeders and forestry authorities, focusing on the areas identified to be at highest risk.

Develop Awareness Plan based on the results of the Risk Analysis, followed by the development of targeted awareness materials in different formats (leaflets, manuals, booklets, posters, radio and TV programs, etc.)

Project Timeline

2 years

Expected budget

t.b.d.

List of partners involved and responsibilities:

Objective 1

LinkTADs: CAHEC, CADC, HRVI, SHRVI, RVC, CIRAD, FAO

External: Forestry Authorities, AQSIQ, non-LinkTADs ASFORCE partners (UCM)

Objective 2

LinkTADs: CAHEC, CADC, HRVI, SHRVI, RVC, CIRAD, FAO

External: Forestry Authorities, AQSIQ, Vet Bureau, non-LinkTADs ASFORCE partners (UCM)

Objective 3

LinkTADs: CAHEC, CADC, HRVI, SHRVI, SVA

External: ASFORCE partners, Universidad Autonoma of Barcelona, Plum Island Animal Disease Center, International Livestock Research Institute (ILRI), etc.

Objective 4

LinkTADs: CAHEC, CADC, HRVI, SHRVI, RVC, CIRAD, FAO

External: Forestry Authorities, AQSIQ

Potential funding and grants where to apply for the proposed project:

- EU (2020 – Trade project)
- 13th 5-year national Chinese plan, submission to MoA
- Gates foundation
- Chinese epidemiological investigations
- National Chinese Research Foundation

5. CSF concept note;

Tentative title of the project:

Improved Surveillance and Control Strategies towards the Eradication of Classical Swine Fever in China

Project overview:

- **Summary of the situation of the disease in the region of interest:**

Classical swine fever (CSF) remains one of the most important diseases of pigs in many countries, particularly in regions with dense pig populations, including China, the biggest pork producer in the world.

CSF is one of the priority swine diseases to be controlled in China, and a compulsory vaccination policy has been carried out for decades. However, the effective control of CSF in China remains a big challenge.

Currently, CSF is endemic or sporadic in most regions of China, and no regions are considered free. Outbreaks are considered to be grossly underreported. Epidemiological surveys show the extensive genetic variation of CSF viruses in China: subgroups 2.1, 2.2 and 1.1, and occasionally 2.3 and 3.4. Furthermore, CSF often manifests as subclinical infections or co-infections with other pathogens, making it difficult to reach a definitive diagnosis. In addition, little is known about CSF in wild boar and the epidemiological role they may play in the persistence and spread.

Despite vaccination being the most important control tool against CSF, China suffers from incomplete vaccination coverage, especially in remote villages and backyard farms. Vaccination schedules are often not based on serological data. This causes improper vaccination timing, which often leads to vaccination failure due to the interference by maternally derived anti-CSF antibodies (MDA). Other factors, such as vaccines of poor quality, BVDV contamination, co-infections with viruses or bacteria, interference by other modified live vaccines (e.g. PRRSV MLV) or immunosuppressive drugs, or intake of moldy feed, may also account for the frequent vaccination failure in the field in China. Commercially available vaccines against CSF are exclusively C-strain-based ones, which are produced in primary bovine testicle (BT) cells, rabbits, or swine testicle (ST) cells. More than 50 bio-companies are involved in vaccine production, resulting in a huge range of products of variable types and quality, which makes it difficult for farmers and local authorities to choose.

- **Main knowledge gaps, challenges and research questions:**

Control of CSF is a big challenge in China due to the following problems and gaps: 1) inadequate epidemiological surveillance information of CSF in domestic pigs and wild boar; 2)incomplete vaccination coverage; 3) too many vaccine producers and insufficient regulation, leading to inconsistent and

unqualified vaccines; 4)“inherent” shortcomings of C-strain-based vaccines (non-DIVA, interference by maternal anti-CSFV antibodies, and possible BVDV contamination); 5) incorrect vaccination schedules, resulting in immunization failure; 6) co-existence of “clean” modern and “dirty” smallholder pig farms; 7) non-strict control of animal movements; and 8) need to standardize the diverse range of diagnostic assays, which leads to inconsistent results.

To improve the surveillance and control of CSF in China, we need to address many issues, but most importantly:

- Strengthen surveillance to obtain comprehensive data on the CSF situation, and study the pig/pork value chain. There is also a need to elucidate the role played by wild boar.
- Ensure vaccine quality control (contamination, stability, etc.) and improvement (development of DIVA vaccines and accompanying DIVA tests).
- Increase vaccination coverage and effectiveness.
- Integrate the regulations and animal disease control measures.

- **Proposed study**

We propose the following objectives and activities:

Objective 1: Epidemiology of CSF in domestic pigs

- Analysis of existing data from a range of sources. The analysis will cover:

  Descriptive analysis of CSF situation using current outbreak and surveillance data;

  Descriptive analysis of the pig sector

- Epidemiology study to look at CSF transmission drivers in identified area(s) and production system(s):

  CSF prevalence, incidence, vaccination coverage

  Risk factors

  Pig/pork value chain

- Recommendations on surveillance improvement, including, but not limited to:

  Understanding and estimating outbreak underreporting and how to improve it

  How to target surveillance

Objective 2: CSF Vaccine Quality Control & Improvement

- Improving the methodology for vaccine titration
- Keeping BVDV out of vaccine manufacturing, i.e. to develop a rapid and sensitive method for BVDV screening in cells, sera and vaccines
- Vaccine improvement:

Lengthen vaccine thermostability and longer shelf life

Oral vaccines (bait) that could be particularly useful for wild boar, and pigs in free-range and backyard settings

DIVA vaccines (with accompanying DIVA tests)

Objective 3: Integrated Control of CSF

There is a general lack of farmer compliance with vaccination recommendations, e.g. storage, dose, manufacturer's choice, frequency, timing, animals selected, etc., which need to be better understood. The proposed approach will include questionnaires combined with serology (to check for seroconversion)

Testing/simulating and evaluating different control strategies by using statistical models (e.g. control of animal movements, etc.)

Retrospective study on CSF outbreaks and risk management

Multi-stakeholder workshops to assess control strategies and how to improve them

Objective 4: CSF in Wild Boar

- Distribution of wild boar populations:

Census data gathering (through close interaction with the Forestry Authorities)

Distribution and density modeling

- Epidemiology survey of wild boar:

Development of a surveillance strategy

Samples from trapped/hunted animals

Non-invasive sampling

Objective 5: Economics of CSF

Economic impacts of CSF in China, both direct and indirect

Cost-benefit analysis of available prevention and control tools

Project Timeline

3 years

Expected budget

TBD

List of partners involved and responsibilities:

Objective 1

LinkTADs: HRVI, CADC, RVC, FAO, CAHEC, SHRVI, HZAU, CIRAD

External: Local animal disease control centers (ACDCs), universities, and pig breeding companies

Objective 2

LinkTADs: HRVI, CADC, SVA, FAO, SHRVI

External: University ofVeterinary Medicine Hannover, Friedrich Loeffler Institute (FLI), pharmaceutical industries, other institutions

Objective 3

LinkTADs: HRVI, CADC, RVC, FAO, CAHEC, SHRVI

External: Veterinary Bureau, MoA, local ACDCs

Objective 4

LinkTADs: HRVI, CADC, RVC, FAO, CAHEC, SVA, SHRVI

External: Forestry Services, Veterinary Bureau, MoA, localACDCs

Objective 5

LinkTADs: HRVI, CADC, RVC, FAO, CAHEC, SHRVI

External: Veterinary Bureau, MoA, localACDCs

Potential funding and grants where to apply for the proposed project:

- EU (2020 – Trade Projects)
- 13thFive-Year National Plans of China, submission to MoA

- Gates Foundations
- Chinese Epidemiological Investigation Plans
- National Research Foundations of China

6. PRRS concept note;

Tentative title of the project:

Improving porcine respiratory and reproductive syndrome (PRRS) control and surveillance in China

Project overview:

- **Summary of the situation of the disease the region of interest**

Porcine respiratory and reproductive syndrome (PRRS) is caused by PRRSV which belongs to the genus Arterivirus of the family *Arteriviridae*. PRRSV contains a positive-sense RNA genome of approximately 15 kb in length, encoding at least nine open reading frames (ORFs), including ORF1a, 1b, 2a, 2b, and 3-7.

PRRSV was firstly isolated from Europe in 1991 and was reported in mainland China in 1996. During 2006 to 2007, outbreaks of a highly pathogenic PRRS strain (HP-PRRS) characterized by high fever, high morbidity and high mortality occurred in Jiangsu, Anhui, and Zhejiang, Jiangxi and Hunan provinces. From January to May 2007, HP-PRRS rapidly spread to 22 out of 34 provinces/provincial level administrative regions, in which at least 194 counties are affected. From 2007 to 2011, the disease was further reported in neighboring countries including Vietnam (2007), the Philippines (2008), Lao PDR, Cambodia, Thailand (2010) and Myanmar (2011). At present, EU strains, classical American strains and HP-PRRS strains coexist and circulate in most areas in China, causing great economic losses every year. Surveillance data show that the virulence of HP-PRRS is reduced, but the current circulating strains still cause clinical signs. Despite the implementation of control strategies and nation-wide vaccination since 2009, PRRS still persists in most provinces with outbreaks mostly affecting middle/small scale pig farms and backyard pigs. Hence PRRS, especially HP-PRRS, is still one of the most prioritized swine diseases in China.

The factors responsible for the current PRRS situation in China are complex, including the un-controlled pig movements across the country, poor biosecurity management, and the characterizations of PRRSV to mutate rapidly and cause immunosuppression of the host. Moreover, the controversial compulsory vaccination strategy currently conducted in China is being criticized for causing the spreading of the vaccination strain which cannot be distinguished from infection and therefore lead to difficulties to control the disease.

- **Main knowledge gaps, challenges and research questions**

Current knowledge gaps and challenges include:

Lack of timely exchange of epidemiological and other relevant information among affected countries, which leads to difficulties to improve national control strategies in China.

Need to improve surveillance by applying risk-based approaches.

Need to promote appropriate and safe application of efficient vaccines that match circulating strains.

Need to strengthen pig movement supervision and comprehensive biosecurity measures.

If feasible, need to implement eradication plans for HP-PRRSV.

During the discussion, six research topics were identified:

Surveillance: Conducting targeted surveillance on PRRS requires a general study of the pig population and its distribution.

Epidemiology/transmission: Identify risk factors, conduct risk assessment and value-chain analysis.

Improve control strategy: Whether to vaccinate or not, when to use the vaccine, and how to achieve safe and appropriate use of vaccination.

Improve the existing diagnosis methods: Establish and evaluate PCR-based differential diagnosis which can distinguish different genotypes (EU/Am/HP); There are too many vaccines available in the market so it is very difficult to develop a DIVA diagnostic method i.e. that can distinguish vaccination from infection.

Vaccine: Develop a safer and higher-antibody-generating vaccine, as well as a polyvalent vaccine.

Economic studies to elucidate whether it is worth to vaccinate all pigs in the country.

- **Proposed study**

Objective 1: Surveillance

General analysis of existing information on the pig sector (pig census and distribution, type of production systems, value chains, etc.)

Surveillance on PRRS (virus and antibody) in identified areas and production systems (breeding farms, big farms, backyard & semen) and slaughterhouses, in order to assess:

–Prevalence

–Strains and mutations

–Pathogenicity & antigenicity

Valuation of the surveillance system and how to improve it

Objective 2: Transmission and risk factors

Cross-sectional study in selected areas/production systems (combining existing surveillance with questionnaires and interviews with farmers):

–Potential risk factors

–Spatio-temporal study

Case-control study (through outbreak investigation of cases, followed by investigation of surrounding unaffected farms)

Outbreak investigation – Analyze existing outbreak investigation reports

Value chain analysis to better understand the different pig production systems across the country

Objective 3: Control of PRRS

Introduction of breeders – Management (from other countries and other farms)

Transport supervision, e.g. pre-movement testing, which could be useful and cost-effective

Improve the scale breeders

Enhance biosecurity of farms

Vaccination

Compulsory vaccination vs. optional vaccination or no vaccination (depending on the area and the risk)

Evaluate the pros and cons of lived vs. killed vaccines (when to use each, and whether to use them both)

Vaccination policy: Look at vaccination strains and schedules to be used in each region. Should we vaccinate the whole country?

Objective 4: Improved vaccines

Vaccine evaluation: Look at the vaccine quality, effectiveness, etc. of all vaccines available in the market (i.e. all producers)

Screen and choose only one vaccine which is safer and more effective

Develop DIVA techniques (vaccine + diagnosis)(for future)

Develop methods to evaluate protective immunity

Objective 5: Economic studies

PRRS cost in terms of morbidity, mortality, control (vaccination, culling, movements, etc.), and surveillance

Cost-effectiveness study of different control strategies:

–Vaccination vs. Non-vaccination (by comparing with desktop models, other countries, and farms that do not vaccinate)

–Type, frequency, coverage, etc.

Socio-economic study on the impacts of HP-PRRS vs. classical PRRS in different production systems

Project Timeline

2-3 years

List of partners involved and responsibilities:

Objective 1:

LinkTADs: CADC, CAHEC, HRVI, SHRVI, HZAU, RVC, CIRAD, FAO

External: Provincial ADCs, VB, pig industry, Danish Vet Research Institute

Objective 2:

LinkTADs: CADC, CAHEC, HRVI, SHRVI, HZAU, RVC, CIRAD, FAO

External: Provincial ADCs, VB, pig industry, Danish Vet Research Institute

Objective 3:

LinkTADs: CADC, CAHEC, HRVI, SHRVI, HZAU, RVC, CIRAD, FAO

External: Provincial ADCs, VB, pig industry, Danish Vet Research Institute, IVDC

Objective 4:

LinkTADs: CADC, CAHEC, HRVI, SHRVI, HZAU

External: CAU (China Agricultural University), Weybridge

Objective 5:

LinkTADs – CADC, CAHEC, HRVI, SHRVI, HZAU, RVC, CIRAD, FAO

External – Provincial ADCs, VB, pig industry, Danish Veterinary Research Institute

7. AMR concept note

Tentative title of the project:

Antimicrobial resistance (AMR) and its transmission in bacteria of animal, environment and human origin

Project overview:

- **Summary of the situation of the disease the region of interest:**

Antimicrobial agents play a most relevant role in the therapy of bacterial infections in human and veterinary medicine. Many different antimicrobial agents are of importance in treating bacterial infections in humans and animals and several bacteria that are commensal and/or pathogenic in animal are food-born pathogens for human,such as Escherichia coli, Salmonella, Methicillin resistant Staphylococcus aureus(MRSA) and Campylobacters. With this background, the emergence of antimicrobial resistance in bacteria of animal origin not only resulted the therapy failure and cost increase in food-animal industry, but also could cause health risk to humans due to the transmission of resistant bacteria and/or resistance genes into the bacteria of human and environment origin. Moreover, the antimicrobial resitance orginated from human and environment origin could also transfer to animal bacteria. The bacteria of animal, environment and human origin could be served as the pool of antimicrobial resistance and the transmission of resistant bacteria and/or resistance genes between each other causes the difficulty to prevent and control the antimicrobial resistance.

Most of the identified resistance genes were both found in bacteria of animal and human origin. Several resistance genes that were firstly identified in animal bacteria could be found in bacteria from human and some of them have great impact in human medicine. For example,the cfr gene was originally found in staphylococcal strains isolated from pigs and cattle. The cfr gene could confer resistance to five classes of antibiotics, including phenicols, lincosamides, oxazolidinones, pleuromutilins, and streptogramin A antibiotics. Of them, the oxazolidinones(linezolid) and pleuromutilins(retapamulin) are the newest drugs that were developed for human medicine. Soon after the identification of cfr gene in staphylococcal strains of animal origin, several studies have showed that this multi-drug resistance gene widely distributed in gram-positive bacteria of human origin and caused treatment failures in clinical.

In these years, development of new antimicrobial agents has considerably slowed down in human medicine andin veterinary medicine. The long-term and overlapped antimicrobial use in animal and human result in the spread of antimicrobial resistance in the bacteria of animal and human origin, which is harmful to the prevention and control of AMR for both veterinary and human medicine.

- **Main knowledge gaps, challenges and research questions:**

Both China and Europe face to the serious situation of AMR. At this time, the mainly challenges and research questions are as following:

- surveillance of AMR with standard method of drug susceptibility test. There are many labs have been worked on the bacteria collections and the MIC test. One of the challenges is how to use these existed resources to collect the data for AMR surveillance.
- Evaluation of the risk of AMR transmission between animal, human and environment. To address this challenge, lab work about molecular mechanisms of AMR tranfer and epidemiological analysis were needed to carry out.
- Control strategy of AMR
- Surveillance of ATB usage and drivers of ATB usage

- **Proposed study**

Based on the discussion in the WP3 workshop, we propose the following objectives:

Objective 1: Surveillance of ATB usage and investigation of the drivers for ATB usage

1)Description of the production system

2)Monitoring the sales with available data (20% of amount)

3)Surveys

- Level of ATB used (g ATB/live animal) per production systems (industrial farms VS backyard farms) for all reasons (treatment/prevention/growth promotion)
- How much drug (%) sold from legitimate drug producers?
- Description of the drug distribution network

4) Study design: cohort studies (sociologists, etc.)

- Who are the advisers of farmers?
- Small farms (internet, local drug dealers, etc.?)
- Large farms (pharmaceutical companies, universities, etc.?)
- Perception of the (cost-)benefits of using ATB?
- Public health issues, animal production issues, labour savings, public opinion, etc.?
- Perception of the benefits of alternatives

- What is the influence of feed millers?

Objective 2: Surveillance of AMR in animals/humans/environment

According to our discussion, we mainly focus on the food-born pathpgens, including Escherichia coli, Salmonella, Methicillin resistant Staphylococcus aureus(MRSA) and Campylobacters and Mycoplasma?.
1) Using existing isolated strains (with standardised diagnostic methods)

2) Prevalence estimation (field studies)

In food producing animals (pigs/poultry/cattle)

Farm/slaughter house/LBM/supermarket

In companion animals

Hospitals (univ.)/Vet practices/Pet shops

In environment

Around farms/slaughter houses/markets

In humans

Farmers/Pet owners/Vet/Nurses

3)Molecular epidemiology

Identify the molecular mechanisms for resistant phenotypes (identified in the previous objective)

Identify the transfer mechanisms (genetics) of antibiotic resistance

Objective 3: Control of AMR

1)Estimate effectiveness of alternatives of ATB

Chinese traditional medicines

Probiotics

Biosecurity/Management practices

2)Drug cycling protocol

3)Promoting the awareness of farmers

Due to the limited time for our discussion, we did not have too much details for this part, please add your ideas and plans for this objective.

Project Timeline

3 years

Expected budget

T.B.D.

List of partners involved and responsibilities:

Objective 1

LinkTADs: SHVRI, HVRI, RVC, CAHEC, HZAU, FAO

External: China Agricultural University, Yangzhou University, sociologists, economists, Zoetis, MoA

Objective 2

LinkTADs: SHVRI, HVRI, RVC, CAHEC, HZAU

External: China Agricultural University, Yangzhou University

Objective 3

LinkTADs: SHVRI, HVRI, RVC, CAHEC, HZAU, FAO

External: China Agricultural University, Yangzhou University, Zoetis

Potential funding and grants where to apply for the proposed project:

China: MoA, MoST, NSFC

External: EU Horizon 2020, BBSRC (UK)

8. JE project overview

Eco-epidemiology and risk analysis of genotype shift of Japanese encephalitis virus in pigs and mosquitos.

Principalinvestigator: ZhiyongMa Consortium:SHVRI,CIRADandSVA

Duration:2015.1–2017.12

ProjectNo:2014DFE30140

Budget: 1,270,000 RMB

Fund: Program of International S&T Cooperation,Ministry of S&T of China (MOST)

Project overview

Japanese encephalitis(JE),avector-borne viral zoonosis caused by Japanese encephalitis virus(JEV), ismost prevalent in China and Southeast Asia and the Far East and causes 10,000-15,000 encephalitic deaths throughout the world annually. Domestic pigs and wild birds are the natural reservoirs of JEV. Transmission of JEV to humans and animals occurs mainly via the bite of infected mosquitoes (e.g. *Culex tritaeniorhynchus*). Infection with JEV causes reproductive disorders, such as orchitis, stillbirths and mummified fetuses, inbreeding pigs and encephalitis in piglets.

Phylogenetic studies have divided JEV into five genotypes(genotype I-V). Genotype III JEV was the most widely distributed JEV in China and South and Southeast Asia. However, genotype I JEV, having emerged in the 1970s in Thailand/Cambodia, has replaced the genotype III as the dominant circulating virus in JE endemic/epidemic regions since the 1990s. This shift in prevalence from genotype III to genotype I has also been occurring in China since 2001.

Some ecological and epidemiological factors, such as pig density, mosquito species and climate, are speculated to associate with JEV genotype shift, however, the exact mechanisms of causing this genotype shift are unknown. In addition, the control strategies established in China are based on the genotype III JEV, for example, the vaccine strain used in China is the genotype III virus, how does this genotype shift influence the current control strategies? The significance and risk on JEV control need to be analyzed

Objectives

The objectives of project are (i) to explore the mechanisms of JEV genotype shift and identify the ecological and epidemiological factors associated with JEV enotype shift; (ii) to analyze the risk of JEV genotype shifton JEV control.

Project Structure

The contents of project include :

- isolation of JEV from pigs and mosquitos in pig farms with different climate and identification ofgenotype of JEV isolates;
- detection of seroprevalence of JEV genotype I andgenotypeIIIinpigfarmslocated at different climatic zones;
- collection of data necessary for eco- epidemiological analysis, such as pig density, vaccination, mosquito species, geographical distribution, climate, paddy fields, etc.;
- analysis of the ecological and epidemiological factors (e.g. pig density,vaccination, mosquito species, geographical distribution, climate, paddy fields) associated with JEV genotype shift and distribution;
- analysis of the effect of JEV genotype shift on pigfarms and the risk on JEV control.

LinkTADs

04.

Workshop Agenda

Agenda

Date: 9-10 April, 2015

Venue: 2 floor, VIP house, Qingdao Garden Hotel, Qingdao, China

DAY 1						
08:00 - 08:30	Registration					
08:30 - 08:40	Welcome remarks (CAHEC)					
08:40 - 09:00	Presentation of group discussions (Facilitator: CIRAD)					
09:00 - 09:20	GROUP PHOTO & COFFE BREAK					
	Room 1			**Room 2**		
	Activity	**Facilitator**	**Participants**	**Activity**	**Facilitator**	**Participants**
09:20 - 09:40 **09:40 - 12:20**	AI presentation AI discussion	CAHEC & CIRAD	CADC/FAO /RVC…	CSF presentation CSF discussion	HVRI & FAO	SHVRI/HZAU…
12:20 - 13:40	*BUFFET LUNCH (Banquet house)*					
13:40 - 14:00 **14:00 - 15:20**	bTB presentation bTB discussion	HZAU & RVC	CADC/CIRAD…	ASF presentation ASF discussion	HVRI & FAO	FAO/CAHEC /SHVRI…
15:20 - 15:40	*COFFE BREAK*					
15:40 - 17:00	bTB discussion			ASF discussion		
17:00 -20:00	*DINNER(Banquet house)*					

DAY 2						
	Room 1			**Room 2**		
	Activity	**Facilitator**	**Participants**	**Activity**	**Facilitator**	**Participants**
08:40 - 09:00	AMR presentation	SHVRI & RVC	HZAU/FAO…	PRRS presentation	CADC & FAO	CAHEC/CIRAD /HVRI…
09:00 - 10:20	AMR discussion			PRRS discussion		
10:20 - 10:40	*COFFE BREAK*					
10:40 - 12:00	AMR discussion			PRRS discussion		
12:00 - 13:00	*BUFFET LUNCH (Banquet house)*					
13:00 - 13:20	JE presentation	SHVRI & CIRAD	HZAU/FAO…	PPR presentation	CADC & RVC	CAHEC/HVRI /FAO…
13:20 - 15:30	JE discussion			PPR discussion		
15:30 - 15:50	*COFFE BREAK*					
15:50 - 16:40	Group discussion report (Facilitator: CIRAD)					
16:40 - 17:00	Wrap-up and Closing remarks (CAHEC)					
17:00 -20:00	*DINNER (Banquet house)*					

Information of discussion session

AI discussion

Facilitator	CAHEC	LI Yin
	CIRAD	Julien Cappelle
Speaker	CAHEC	ZHANG Yi
	CIRAD	Julien Cappelle
Participants	CADC, FAO, RVC…	

CSF discussion

Facilitator	HVRI	QIU Huaji
	FAO	DanielBeltranAlcrudo
Speaker	HVRI	QIU Huaji
Participants	SHVRI, HZAU…	

AMR discussion

Facilitator	SHVRI	LI Beibei
	RVC	Timothee Vergne
Speaker	SHVRI	LI Beibei
	RVC	Timothee Vergne
Participants	HZAU, FAO,CIRAD…	

PRRS discussion

Facilitator	CADC	ZHAI Xinyan
	FAO	DanielBeltranAlcrudo
Speaker	CADC	ZHAI Xinyan
Participants	CAHEC, HVRI…	

bTB discussion

Facilitator	HZAU	GUO Aizhen
	RVC	Timothee Vergne
Speaker	HZAU	GUO Aizhen
	RVC	Timothee Vergne
	CADC	WANG Xiaoying
Participants	CADC, CIRAD…	

ASF discussion

Facilitator	HVRI	QIU Huaji
	FAO	Daniel Beltran Alcrudo
Speaker	CAHEC	ZHANG Zhicheng
	FAO	Daniel Beltran Alcrudo
Participants	FAO, CAHEC, SHVRI…	

JE discussion

Facilitator	SHVRI	MA ZhiYong
	CIRAD	Julien Cappelle
Speaker	SHVRI	MA ZhiYong
	CIRAD	Julien Cappelle
Participants	HZAU, FAO…	

PPR discussion

Facilitator	CADC	LI Shuo
	RVC	Timothee Vergne
Speaker	CADC	ZHAO Bolin
	RVC	Bryony Jones
Participants	CAHEC, HVRI, FAO…	

LinkTADs

05.

Participants List

List of participants

Participants:

- Food and Agriculture Organization of the United Nations (FAO)
- Centre de Cooperation International en Recherche Agronomique pour le Developpement (CIRAD)
- Royal veterinary College (RVC)
- China Animal Disease Control Center (CADC)
- China Animal Health and Epidemiology Center (CAHEC)
- Shanghai Veterinary Research Institute (SHVRI) of Chinese Academy of Agriculture Sciences (CAAS)
- Harbin Veterinary Research Institute (HVRI) of CAAS
- Huazhong Agricultural University (HZAU)
- Zoetis

LinkTADs

LinkTADs Epidemiology Workshop, April9-10, 2015, Qingdao, CHINA

Participants List

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LinkTADs

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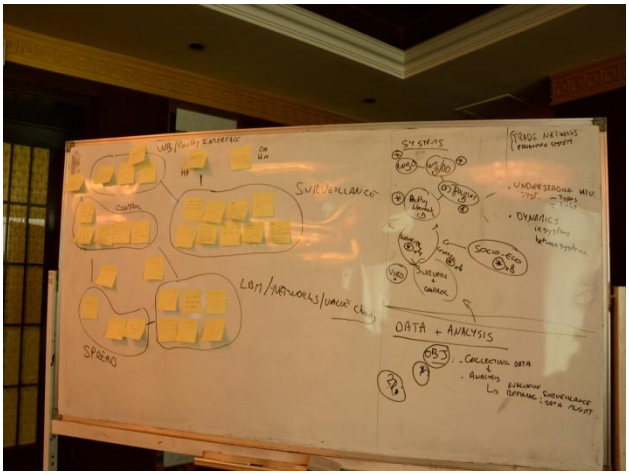
LinkTADs

06.
Illustrations

Group photo

Opening and closing sessions

Discussions



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