STAR-IDAZ
International Research
Consortium on Animal Health

Challenges in Animal Health

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Presentations

Basic research on animal health – J-C Cavitte

The Challenges of Epizootic Diseases in Europe - W van der Poel

Epidemiological challenges in EU and Research Needs - M Peyre

PIG DISEASES - P Baekbo

The molecular epidemiology on Mycoplasma Hyopneumoniae – G Shao

Mycoplasma Research at Harbin Veterinary Research Institute - L Henggui

Strategies for Intra-cellular protozoosis control - J Zhang

The Challenges of intra-cellular pathogens (with particular reference to bacterial infection of macrophages) – A Morrow

Basic research on animal health

(with focus on intra-cellular pathogens of animals

Current EU-China collaborations

SAPHIR (*Strengthening Animal Production and Health through the Immune Response)* *Targets* Porcine Reproductive and Respiratory Syndrome Virus and *Mycoplasma hyopneumoniae of pigs; Eimeria* and *Clostridium perfringens of* chickens; Bovine Respiratory Syncytial Virus and *Mycoplasma bovis of cattle* to develop generic vaccine approaches applicable to other pathogens

PARAGONE *Vaccines for animal parasites*

Animal health related topics in 2017

Alternative production systems to address anti-microbial drug usage, animal welfare and the impact on health – RIA; SFS-46-2017 - *EU-China FAB Flagship initiative.*

EPIZOOTIC disease challenges in Europe

Diseases:

- Schmallenberg virus; Bluetongue; Lumpy Skin Disease; African Swine Fever
- Avian Influenza

Solutions needed

- Better vaccines
- Better monitoring strategies/frontline diagnostics/ early warning
- Surveillance strategies; drivers of disease outbreaks

Epidemiological challenges in EU and Research Needs

Towards improved surveillance and control strategies

- Understanding the risks of disease emergence, introduction, endemic cycle
- Understanding the constraints of current strategies (technical, social and economical)
- Innovative surveillance design (risk-based; syndromic etc…)
- Evidence based strategies

Promoting economic evaluation

- innovative and adapted methods;
- development of decision tools

Promoting OH approaches, how to integrate animal and public health surveillance? How to implement OH actions in the field? Understanding its added value?

Promoting participatory approaches, interdisciplinary research (epidemiology, sociology, economy)

Improving information sharing and regional approaches, standardised epidemiological approaches (spatial, molecular…)

Training needs adapted to new development in epidemiology: postgraduate curriculum

Pig Disease challenges

Emerging and re-emerging diseases: PRRSV; PED

Piglet diarrhoea: PED; TGE; Rotavirus

Diarrhoea post weaning: E.coli; Lawsonia intracellularis; Brachyspira;

Porcine Respiratory Disease Complex: Mycoplasma; Actinobacillus; Pasterurella (+ PRRSV/PCV/Influenza)

Zoonotic infections: salmonellosis; MRSA

Research needs:

Vaccinology – multivalent; application route

Minimal Disease Production Systems – Housing; animal movements

Pen-side diagnostics - On-line monitoring of symptoms/infections (Real-time)

Protozoal Infections in China

Specific Disease Challenges: Babesia, Theileria, Toxoplasmosis, Eimeria

Research needs:

Epidemiology

Vaccines

Structural analysis and bioinformatics of target proteins

Chemical control

Additional suggestions from Chinese delegates

Antibiotics Replacement selection to control protozoa.

- Chinese herbs Screening and its target finding on protozoa
- Application of screened Chinese herbs on piroplasma infection treatment.
- Functional genetic mechanism research of Antibiotics Replacement Chinese herbs.

Additional suggestions from Chinese delegates - Mycoplasma

Swine mycoplasmosis control research

- Field strain isolation from different area origin breeding pigs to make etiology and pathogenesis research.
- new adjuvant and live vaccine development to improve MHP vaccination effect.
- Explore the mechanism of immune inhibition and escape of MHP

CBPP control research

- Surveillance of CBPP
- live vaccine development, new field strain protection examination.
- Explore the immune mechanisms of CBPP vaccination.

The Challenges of intra-cellular pathogens (with particular reference to bacterial infection of macrophages

Here one of the cells involved in the front line of protection systems in being manipulated by the pathogen

Specific Diseases – Brucellosis; TB, Paratuberculosis; Q fever; Salmonellosis.

Research needs: Improved vaccines – need to gain a better understanding of the pathogen- host cell interaction to develop new vaccine candidates

General discussion

Epizootic diseases - Priorities largely different between Europe and China (Avian Influenza of interest to both but different approach to control)

Endemic Diseases PRRSV and Respiratory Disease Complex; Brucellosis; Tuberculosis; Coccidiosis

Better Vaccines needed – (to reduce antibiotic usage) bacterial disease such as respiratory disease complex a particular problem; Brucellosis and TB; Coccidiosis; Underpinning science relating to vaccines

Epidemiology – Understanding risk of emergence and spread; risk-based surveillance systems, strategies for disease eradication?. (need to reflect further on this),

Vaccines /Vaccinology

Vaccine technology – vectors, adjuvants, multivalent, application, underpinning immunology,

Better Vaccines needed

To reduce antibiotic usage - bacterial disease such as porcine respiratory disease complex (a particular problem which is shared between EU and China);

Other - Brucellosis and TB of ruminants; Coccidiosis of poultry ;

General – vaccines that fail to give sterile immunity may be driving pathogen virulence

Identifying potential collaborations In the LinkTADs consortium

The main objective of the online questionnaire was to **identify the diseases for which LinkTADs partners could set up EU-China and epidemiology-laboratory sciences collaborations in the future.**

Based on the questionnaire results, we selected diseases for which at least 1 Chinese and 1 European partner and at least 1 epidemiology and 1 laboratory sciences partner showed a high interest (score above 4).

According to these results 10 diseases were selected:

African swine fever
Antimicrobal resistance
Avian Influenza
Bovine tuberculosis
Classical swine fever
Foot and mouth disease
Japanese Encephalitis
Porcine Epidemic Diarrhea
Porcine Respiratory Reproductive Syndrome
Rabies

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Thank You For Your Attention

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