European Commission and EFSA Workshop

'What research priorities to fight animal influenza?'

8-9 January 2015, Parma (Italy)

Summary of outcomes

To feed the reflection on the future research agenda on animal influenza, the European Commission's (EC) Directorate General for agriculture and rural development and the European Food Safety Authority (EFSA), in collaboration with EC's DG Research and Innovation, organised a workshop on 8-9 January 2015 at EFSA premises in Parma.

Challenges, objectives and audience

Fighting animal influenza is a major challenge for animal and human health which requires continuous knowledge building and development of appropriate control tools. Influenza has been identified as one of 3 top priorities in the tripartite collaboration between the main International Organisations interested in animal and human health: World Organisation for Animal Health (OIE), Food and Agriculture Organisation (FAO), World Health Organisation (WHO).

This event aimed at carrying out a priority research gap analysis based on expert opinion. The starting point was the mapping of results of around 25 research projects supported by the EU since 2002 in the area of animal influenza. The discussions focussed mostly on state of play, knowledge gaps and priorities for research subjects on animal influenza. While discussing these issues, participants took into account the European and International framework on animal influenza and related policy needs.

24 scientists, including representatives of EU funded projects, delegates of relevant European and International organisations (FAO and OIE) as well as the United States Agricultural Research Service (USDA-ARS) participated in the workshop together with a dozen of representatives from European Commission's Agricultural, Research and Innovation and Health and Food Safety departments, the European Centre for Disease Control (ECDC), EFSA and the EU Reference Laboratory for Avian Influenza.

Overview of the meeting

The EC Directorate-General for Health and Food Safety introduced the workshop by providing participants with an epidemiology update and an overview of the Union's animal health policy. Presentations and discussions were then organised around four themes:

- **host-pathogen interactions;**
- **diagnostics;**
- **surveillance and risk assessment;**
- **prevention and control.**

For each of these themes, an expert first presented an overview of current knowledge and of knowledge gaps identified, and then opened the floor for a discussion.

Scientists then split into breakout sessions to identify priority research needs on each of the four themes. They looked also at other initiatives like the Research agenda elaborated by the joint OIE-FAO network of expertise on animal influenza (OFFLU) or the USDA workshop on animal influenza viruses gap analysis held in spring 2014. The priority research needs identified were then discussed in a plenary session.

In a final plenary session on 9 January, all participants discussed Research policy aspects with the delegates of European and International organisations such as USDA-ARS, EFSA and ECDC and European Commission staff.

Conclusions

Discussions led to the conclusions that **major gaps still exist in virtually all four themes tackled** during the workshop, despite the undisputable contribution by EU-financed projects of new knowledge about this epizootic, trans-boundary disease affecting a number of species and humans.

Further knowledge is particularly needed on **host pathogen interaction**, both on the pathogen and host sides. On the pathogen side, we need to better understand how influenza viruses become capable of crossing between species or acquire pandemic potential. On the host side, more knowledge is needed on how the immune system protects against or contributes to pathogenesis. A relevant research subject would be to identify **virus and host determinants of virus replication** to understand which hosts the virus is able to infect (host range restriction) and to identify mechanisms which viruses use to adapt to new host species.

Regarding diagnostic tools, the workshop concluded that the already-existing panel of diagnostic tools could be improved further. Improved tools are needed in particular for **integrated and multiplex rapid molecular tests**, **serological tests** and **virus recovery methods**. Besides technical improvement, there is also a need to reduce the time between first detection of clinical signs by a farmer, submission of samples to a laboratory and notification of results.

Surveillance and risk assessment of influenza viruses are quite advanced. Epidemiological models are now used fairly commonly to inform policy making. However, their main focus tends to be on certain subtypes of animal influenza viruses only. Furthermore, they take account of neither economic nor human behavioural factors. To build more efficient surveillance systems and risk assessment tools, we need to further develop **modelling methodologies which can estimate risk levels based on data on virus evolution and characteristics**. Possible research subjects identified were the **development of integrated risk assessment tools**, interface studies for different host species and early detection of animal influenza introduction into the EU. Within the context of "One Health" (an approach which looks at human and animal health together), integrated research needs to be conducted that links the animal, human and environmental dimensions of systems within which avian influenza viruses exist. It is essential that this research connects natural sciences with social sciences, so that the drivers of human behaviour are taken into account in resulting models and tools.

On prevention and control, participants identified the need for **integrated research on the effectiveness of known biosecurity measures including development of novel ones**. There too, research must use social science approaches to better understand the drivers of human behaviours of those who have to implement these measures.

Regarding vaccination, the main challenge is to develop more efficient vaccines that could be used in routine or emergency vaccination programs. There is also a lack of certain vaccine delivery methods (this is methods which can be applied safely with mass application, like in spray or in drinking water) and efficacious **cross-protective vaccines**. Development of an efficacious **emergency vaccination program for Highly Pathogenic Avian Influenza (HPAI)** is missing and a public-private partnership might make progress in this field. Some elements of research for the improvement of routine vaccination in endemic countries, especially for ducks, were also identified.

As regards more general aspects, although four major themes were identified, the meeting highlighted the need for researchers of different disciplines to **interact and jointly work towards a common goal**. This need for integration of disciplines was also highlighted by several of the research projects included in the mapping exercise undertaken as preparation for the workshop. Participants raised issues like the difficulty to organise epidemiological monitoring in absence of a regulatory framework, the need to collect good quality field epidemiological data along with isolates (for instance on pathogenicity, vaccination), or the need to have open access to data.

Participants also highlighted the regrettable **short-term approach to networks, resources and tools** (in particular databases) generated by EU-financed projects which are often not maintained or cross-linked beyond the projects' end.

Finally, it was generally acknowledged that **international cooperation on research in animal influenza is critical**, not least because of budgetary constraints. The workshop highlighted the need for EU and international funding organisations to coordinate upcoming initiatives in the field of animal influenza in order to maximise outcomes.