**Digivet - Digitalisation of livestock data to improve veterinary public health**

[**http://www.dcs.gla.ac.uk/~jenright/digivet\_website/index.html**](http://www.dcs.gla.ac.uk/~jenright/digivet_website/index.html)

[**https://www.sva.se/en/foka/digitalisation-of-the-veterinary-public-sector-to-improve-safety-and-preparedness/**](https://www.sva.se/en/foka/digitalisation-of-the-veterinary-public-sector-to-improve-safety-and-preparedness/)

[**https://zenodo.org/communities/digivet/**](https://zenodo.org/communities/digivet/)

**Case studies**

While we have organised our project into methodological work packages, we are planning three core case studies that will run across these work packages to illustrate the following challenges: food safety (CS1), antimicrobial usage in livestock (CS2), and contagious exotic diseases of livestock (CS3). These case studies offer opportunities to explore different data landscapes and ecosystems in each of the partner countries, as well as representing distinct, albeit related, data challenges. Where current availability of data is either limited or strictly controlled (as we expect for CS2), more of the work will occur within WP1 to identify the blocks underlying the lack of available data. For CS1 and CS3 where a large quatity of digital data is already available to the project team, proportionally work will take place under WP2/3.

***CS1* (FOOD SAFETY): *Food safety - surveillance and control of foodborne disease***

This case study will assess the direct societal impact of livestock data in the context of public health. Foodborne illness impacts approximately 1 in 10 people globally each year, with the most commonly identified pathogens (including *Salmonella, Campylobacter,* and *Enterohaemorrhagic Escherichia coli*) often transmitting via eggs, dairy, meat, and other animal products [6]. Surveillance for potential foodborne pathogens at abattoirs is mandated by EU law, and on-farm occurrence of many of the relevant pathogens is also recorded [4]. For example, the *Salmonella Dublin* status of every cattle herd in Denmark is made publically available via the central herd information repository (<https://chr.fvst.dk/>), which is perhaps surprising given the potential for public interest in this disease. Despite European regulations, different approaches are often employed by different countries; for example the nordic countries have applied much stricter controls to *Salmonella* in eggs than that mandated by the EU, and as a result are able to label their eggs as *Salmonella*-free. Under WP1, the various potentially-relevant sources of data will be described for each of the partner nations, and drivers and barriers identified. WP2 will explore the potential for newly available software tools to be applied within the context of food security, and WP3 would assess the potential societal impacts of increased uptake of these sources of information within wider society.

***CS2* (AMU)*: Health security - antimicrobial usage***

This case study will focus on the challenges and drivers for digitalisation of antimicrobial prescription and usage data. The evolution of antimicrobial resistance (AMR) is a major problem in both human and animal health, and slowing the increase of AMR has been identified as a modern grand challenge [6]. It is also widely recognised that control of AMR is a cross-sector problem, and use of antimicrobials in animals has been highlighted as a potential source of AMR affecting both humans and animals. Consumers across the Nordic countries are becoming aware of these issues and livestock industries are reacting to a perceived consumer preference for reduced antimicrobials in their feed. For example, the Danish supermarket Netto has recently introduced a line of Danish pork reared without the use of antimicrobials along with an advertising campaign revolving around the human health aspects of reduced-antimicrobial pork. The Nordic countries and certain sectors in the UK already have surveillance systems dedicated to monitor the presence of AMR bacteria in healthy and sick animals, but a comprehensive surveillance against AMR would require also the availability of antimicrobial prescription and antimicrobial usage data. The availability of these two pieces of information varies widely among countries, but is typically not accessible to the governmental agencies responsible for surveillance. Research is needed to understand how to balance private interests and public safety, and what frameworks can be built with the support of consumer-driven demands for traceability and transparency. The main focus of this case study will be to explore the issues relating to digitalisation of antimicrobial usage data from the perspectives of industry, government and the wider society.  The potential methods, uses and impacts of extracting surveillance value from existing data will be explored under WP2 & WP3.

***CS3* (ASF)*: Economic security - transboundary spread of contagious and exotic diseases of livestock***

In contrast with the direct societal impacts associated under CS1 and CS2, this case study will explore how the availability and use of livestock data has indirect societal impact via food security and the economic sustainability of the livestock industry. African swine fever (ASF) was selected as the example disease based on its current importance (i.e it has wiped out a significant proportion of Chinese pork production causing significant hardship [7]), and in particular the economic risk it poses to European pig production [8]. Diseases such as ASF are difficult to control at a national level due to the potential for disease to spread across borders, either via import of infected meat/pork products by unsuspecting consumers (particularly from eastern Europe where such products are available at relatively low cost and are regularly imported both legally and illegally into e.g. Denmark) or via spread of infected wildlife such as wild boar. The introduction of wildlife into this equation increases the scope of the disease from purely economic to a wider societal issue: the controversy around badger culling to control bovine tuberculosis is well known in the UK, and similar concerns have been raised in relation to the “wild boar fence” currently being erected between Germany and Denmark. All these issues are further complicated by the difficulties in exchanging data between countries to facilitate exploration of disease control options via mathematical and statistical modelling. WP1 will explore the international availability of livestock and wildlife demographic and disease occurrence data, along with political and commercial barriers to the optimal use of these data. WP2 will compare and harmonise data format standards between partner countries with a focus on improving interoperability of the potentially available data, and WP3 will look at the potential international impacts of the various national and industry-lead policies that control access to critically important data sources.