



# Livestock Production Diseases and European Food Security

Production diseases are diseases which persist in intensive animal production systems, and the more intensive the system, the more prevalent or severe such diseases become. These diseases, such as lameness in sows and post-weaning diarrhoea in pigs, or enteritis and locomotory problems in poultry, have a great impact worldwide. The impact occurs because animal health and welfare is compromised, and there is a loss in performance, involving increased mortality and morbidity. Treatment and control of such diseases is the major reason for the use of antibiotics in the food chain.

At a time of continuing world population growth and increasing concerns about future food security, sustainable intensification of livestock production has become a policy objective. However, intensification of production can increase the level of potential disease which animals experience whilst, at the same time, making them more susceptible to such disease. This increased susceptibility results from metabolic changes associated with selection for a high level and efficiency of production, and from increased risk of stress in the animals associated with their

more restrictive environment.

Production diseases usually originate from a complex interaction of genetics, environment (including housing, nutrition and management) and pathogens. In the past, efforts to control production diseases have focused on controlling either the pathogen or the animal's genetic susceptibility. In reality, there are many interacting factors which

the farm interact with the inherent resistance in an animal, and also look at the biological mechanisms that underlie the differences in susceptibility between animals in the same environment, we will be able to develop more effective control strategies. This will result in demonstrable improvements to animal welfare as well as bringing economic benefits.



*Intensive production: an integrated approach to livestock disease management is required*

determine whether an animal which is subject to an infectious or metabolic challenge will show clinical, or subclinical, signs of disease. The PROHEALTH project is motivated by the belief that a **more holistic view of production diseases is required.**

If we investigate how the many different and complex factors on

## Social Listening: a tool in the service of Food Security?

Communication of scientific research is vital in raising public awareness on critical societal challenges like food security. However, this is not an easy task as subject matter can be highly complex with a diverse target audience. In order to improve communication, there are a number of important questions to be answered:

- » Where and when do audiences go online?
- » What do they want to know?
- » Where do they look for information?
- » How could we communicate information across the audience?
- » Where do social media fit in?

Novel 'social listening' digital techniques allow us to crawl the internet to measure exactly where audiences of interest go and what they are talking about. This offers a better understanding of professional challenges, industry insights and trends. We can then use social and community channels to enable stakeholder

interaction and allow effective communication.

In February 2014, PROHEALTH and Brewlife launched their own proof-of-concept social listening campaign that spanned twelve months of swine industry conversation in the United Kingdom and Belgium. What did we find?

### How many online conversations are there?

The size of the pig production industry in a country does not predict online usage - smaller more vocal countries may actually be more influential. Pig production is worth €1.7 million annually in Belgium, and €1.4 billion in the UK; however nearly 13 times more online conversations took place in the UK than in Belgium on pig production.

### Who is talking about pig farming online?

Journalists are the primary group driving online conversation about pig farming in the UK

(37%), whereas in Belgium the government agencies predominate (34%). Farmers contribute to just 9% of online conversation in the UK. Of these farmers, 54% use Twitter as their primary mode of communication.

### What do they talk about?

The key topics at the heart of discussion are:

- » **Disease transmission** – fears about disease spread in the EU (e.g. ASF / African Swine Fever), emerging diseases, biosecurity and vaccination, import and export trade restrictions
- » **Welfare** – poor animal welfare standards in Europe drive support for 'Buy British', debate over castration practices, potential use of alternative methods (e.g. immuno-castration)
- » **Product labelling** – new labelling laws impacting upon production, procedures and trade
- » **Responsible use of anti-infectives** – concerns over human consumption risks and drug resistance that could affect animal production.

### What now?

This initial pilot study is very promising. The key now is to use this novel sophisticated social listening mechanism to communicate the scientific results of PROHEALTH effectively to the diverse range of stakeholders in pig and poultry communities. Social media are rapidly expanding and provide the ideal place to make the latest scientific information readily accessible, stimulating development of vibrant social networks within farming.



Channels included in analysis:



VIDEO



TWITTER



NEWS



BLOG



FORUMS

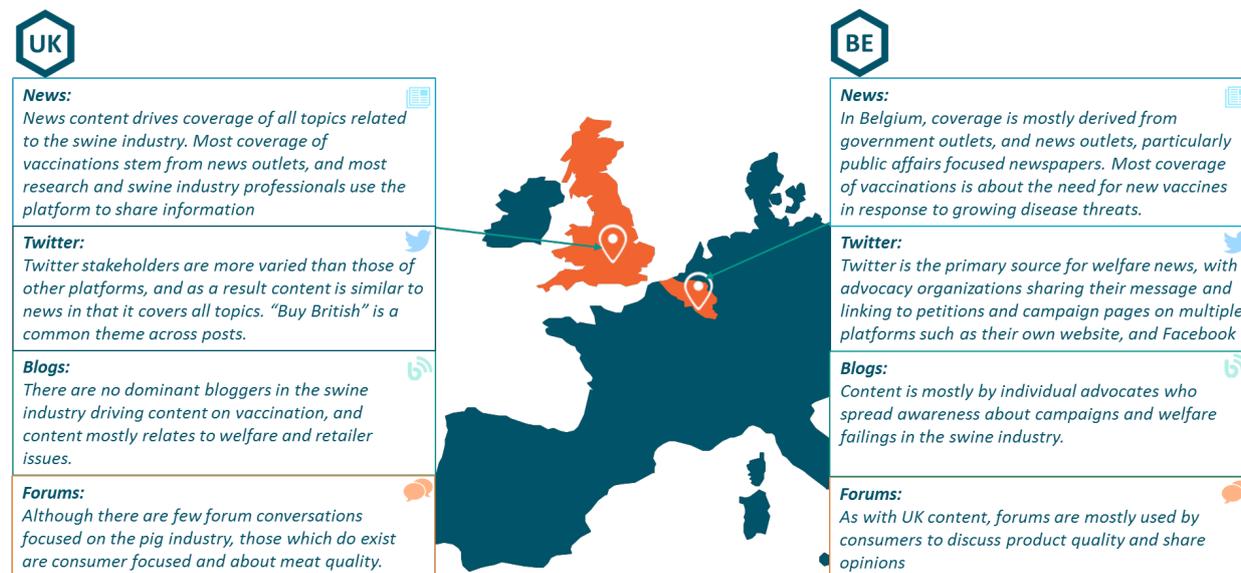


FACEBOOK

#### Data samples:

Coded data are based on a randomly selected sample of conversations. Sample sizes are dependent on overall conversation volume and the relevance of the content.

How many online conversations are there?



Where conversations happened

## New digital devices and sensors will provide the missing data link between farm environment and disease

Does the farm environment (temperature, humidity, CO<sub>2</sub> levels, etc.) influence the appearance of certain animal diseases? Do these parameters influence the temporal expression of the diseases, such as when they appear and for how long they persist? These are two of the questions that the PROHEALTH research team aims to answer, thanks to innovative approaches to on-farm data collection.

We know already that ambient temperature is a trigger for certain diseases and that poor water availability as well as humidity can predispose animals to illness. However, there is an overall lack of tangible data to demonstrate the link between farm environment, health and productivity, and hence to confirm the impact of environmental influences on diseases.

PROHEALTH will be addressing this problem by employing digital devices specially designed for the project. Data on various aspects of the environment in both pig and poultry farms across Europe will be collected by means of sensors.

"We have already set up sensors in 26 farms in France, Spain, Cyprus, the UK and Belgium, and we have started the collection of clinical data last month," says Carlos Piñeiro, CEO of PigCHAMP Pro Europa, Leader of the work package of the PROHEALTH project responsible for the on-farm data collection. "Through this approach, our experience of data collection and our follow-up measures, we will ensure consistent data capture that will result in a comprehensive, unique database."

Next steps? "With the real-time data collection offered by the different devices, we will be able to establish and visualize in the upcoming months the relationship between farm environment and diseases, and to start to draw conclusions that will lead to our final recommendations" – Piñeiro concludes.



Base unit of the on-farm sensor system

# What is your Biosecurity Score?

Easy to use online tool to score management and biosecurity in pig and poultry farms

In most pig and poultry farms in Europe, animals are raised under intensive conditions, with large numbers of animals housed on the same site and/or sharing the same airspace. Producers try to optimise management, nutrition and housing to attain production targets. However, on many farms, animal health, welfare, and also production, may suffer because of various infectious and/or non-infectious challenges.

The PROHEALTH project aims to improve understanding of different production diseases in pigs and poultry kept in

intensive systems across the EU and what makes such diseases thrive. To achieve this, members of Ghent University developed online scoring tools to assess biosecurity on pig and poultry farms. As well as being used in the PROHEALTH project, the tools could also be used by any farm manager to improve the on-farm internal and external biosecurity. They can be used to highlight weaknesses (e.g. improper stocking density in nursery pigs, insufficient health monitoring of purchased breeding animals, lack of disinfection after emptying the stables) and to open

up discussion with everyone involved at farm level. This could help, for instance, to address the current porcine epidemic diarrhoea (PED) outbreak in Europe.

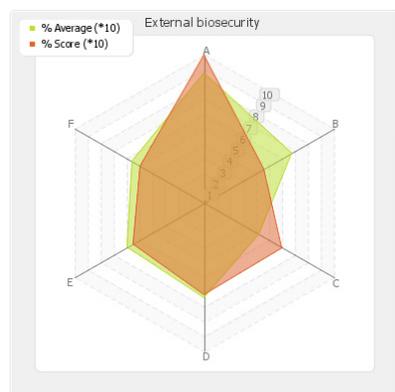
## How do the PROHEALTH online scoring tools work?

The online scoring tools are species-specific and have been developed in order to score practices in an objective and standardised way across Europe. The questionnaires combine previous Ghent University experiences and PROHEALTH partners' insights. Within the project, the online tool will be used in different EU countries to score management and biosecurity practices, and to assess risk factors for production diseases in pig and poultry farms.

The questionnaires are divided into a number of subcategories, each containing questions related to specific aspects of management and biosecurity. These are translated into scores based upon their relative importance in disease prevention. The final score for a herd may vary between 0 (worst) and 100 (best). When the responses are complete, a visual report is generated (see illustrations on left).

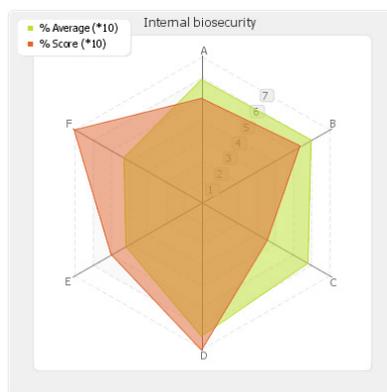
The online scoring tools can be accessed through the PROHEALTH website:

[www.fp7-prohealth.eu](http://www.fp7-prohealth.eu)



### External biosecurity

- A. Purchasing policy
- B. Removal of animals, manure and carcasses
- C. Supply of fodder, water and equipment
- D. Access check
- E. Vermin and bird control
- F. Location and environment



### Internal biosecurity

- A. Management of diseases
- B. Farrowing and suckling period
- C. Nursery unit
- D. Fattening period
- E. Compartmentalizing, working lines
- F. Cleaning and disinfection

## Key Facts

22 European partners:  
12 industry, 10 academic  
Project duration:  
01/12/2013 – 30/11/2018  
Project coordinator:  
Prof Ilias Kyriazakis,  
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