

Monitoring swine health in the Netherlands: an online platform tool

M GONGGRIJPI, F SCOLAMACCHIA¹, T GEUDEKE¹, G VAN SCHAIK^{1,2*}

¹GD Animal Health, Arnsbergstraat 7, 7418 EZ Deventer, The Netherlands; ²Faculty of Veterinary Medicine, Department of Farm Animal Health, Utrecht University, Yalelaan 7, 3584 CL Utrecht, The Netherlands

*g.v.schaik@gdanimalhealth.com

Abstract

The need for timely animal disease information has become more crucial than ever, not only for animal health stakeholders but also for the general public worldwide. As the field of veterinary monitoring and surveillance continues to develop, the adoption of new tools able to collect important information from the field, becomes essential in order to promote farmers and veterinary practitioners participation and allow data integration from different sources. We propose to review an online platform, which besides other passive and active data collecting tools, was set up in the Netherlands to complement the porcine health surveillance system. After one year from the introduction of the Online Monitor Porcine Health system, 1800 farm visits are reported per month. An example is provided on how clinical signs observed in the fields can be combined with this online platform system to increase the sensitivity and specificity of surveillance of swine health.

Keywords: *Monitoring, animal health, syndromes, online platform, pigs*

Introduction

With an animal population of four million cattle, 1.5 million sheep and goats, 16 million poultry and 14 million pigs and an intensive animal production system, animal health surveillance is essential in the Netherlands. GD Animal Health has been commissioned by the Dutch Ministry of Economic Affairs, producers organisations and interbranch organisations to design and conduct the national animal health surveillance program.

GD Animal Health collects information for monitoring and surveillance purposes both passively as well as actively, relying on the initiative of farmers and veterinary practitioners as well as on data suppliers (Figure 1).

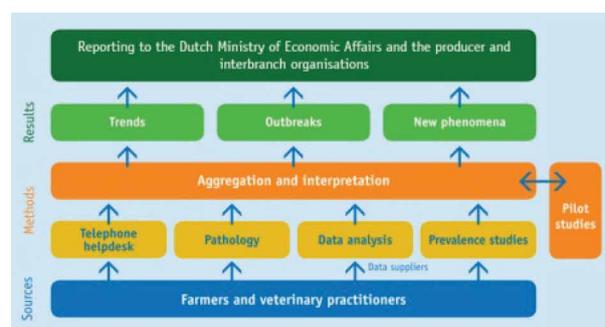
The main goals of the animal health surveillance program in the Netherlands are:

1. monitor trends and developments in animal health and related parameters;
2. detection of outbreaks of (re)emerging diseases;
3. detecting animal disorders never reported before in the Netherlands.

The passive component of the swine health surveillance program consisted, until July 2015, on two data collecting

tools: the telephone helpdesk, and the post-mortem examination. Every two weeks the collected signals are extensively analysed and every three months discussed with a supervisory committee. The key findings are then reported twice a year in a newsletter. The authorities (the Dutch Food and Consumer Product Safety Authority (NVWA)) are immediately notified when a notifiable disease is suspected.

Figure 1. Flowchart of the animal health surveillance program carried out by GD Animal Health.



In addition to these tools, the Online Monitor Porcine Health came into force in July 2015. In the Netherlands it is obligatory that each month a farm is visited by their veterinary practitioner. From July 2015 on the veterinarians could enter the observed clinical signs at each visit in an online form. This form is part of the internet-based platform VeeOnline (1), a service provided by GD, which allows both farmers and veterinary practitioners to consult and exchange information with GD (e.g. farm health plans, farm treatments, diagnostic results, farm health status).

After an initial test period, the Online Monitor Porcine Health became compulsory in January 2016. By collecting and analysing the data entered via this internet-based tool, GD Animal Health aims at providing a better overview of the trends and developments of porcine health in the Dutch pig industry.

This paper outlines the main characteristics of the new online monitoring platform and describes the results after one year from its implementation.

Materials and methods

The Online Monitor Porcine Health is an internet-based form

where each veterinary practitioner can report the health status of each farm at the monthly visit. In particular, information that can be recorded include:

1. Date of the visit and unique identifier of the farm.
2. The pig category: weaned and non-weaned piglets, fattening pigs, breeding pigs, sows and boars.
3. Presence or not of health disorders at farm-level.
4. Organ system involved: respiratory system, digestive system, skeletal/muscular system, urinary tract, skin, reproductive system, nervous system, behavioral disorders, general disorders.
5. Main symptoms: cough, diarrhea, anorexia, etc.
6. Most likely diagnosis/pathogen: *Salmonella* spp., PRRS etc.

The data collected are imported in statistical software and validated before the farm-level information is analysed. For each pig category the percentage of farms in which an organ system disorder has been detected is calculated as an overall percentage and stratified by regional area. If an unusual increase in the percentage of farms with a specific organ system failure is detected, a more in-depth analysis can be done to identify which clinical signs are associated. Data analysis is carried out using Stata 14 (Stata Corporation, Texas, USA).

Results are presented and discussed within the team of pig veterinarians at GD, who evaluate the information in light of that collected via the phone calls to the consultancy service Veekijker corroborated by diagnostic results or post-mortem examination.

A final monthly report is then produced for each veterinary practice, where data are presented for each animal category and main organ system disorders against the national average. A geographical distribution of the specific organ system failures per pig category is provided by mapping the percentage of affected farms over the total farms registered per area. Each veterinary practice will receive an email notification when a new report is available online. An example on how the results are provided in the monthly report is shown in Figure 2.

Results

Since July 2015, pig veterinarians have collected clinical information of on average 1800 individual farms per month via the online monitoring tool of GD, and the number of reports is still increasing (Table 1). Health disorders were detected in approximately 40% of the farms visited. The most commonly registered issues were fertility problems in sows, intestinal problems in suckling piglets, nervous system disorders, digestive tract and respiratory problems in weaned piglets and respiratory issues in finishers.

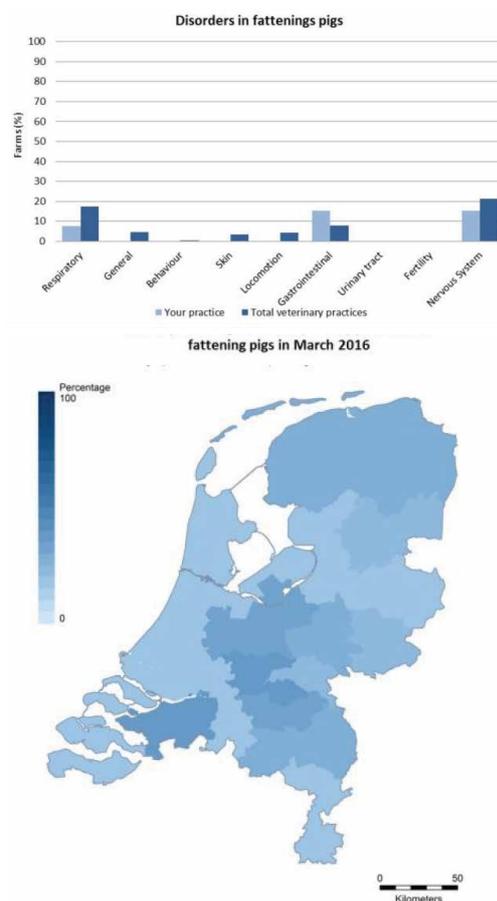
As the monitor is still in the start-up phase, we cannot yet make clear statements with regard to trends or regional differences. The obvious seasonal variations, such as sow fertility problems in autumn and respiratory problems in the cold period, were already observed, but it is still too early to determine more subtle trends in time.

In August 2016, the first example on how the data collected via the Veekijker telephone helpdesk service can be coupled with those entered via the Online Monitor Porcine Health, was created.

Table 1. Monthly overview of information collected since July 2015.

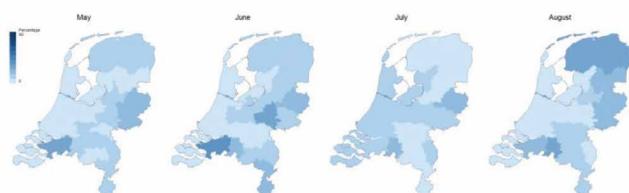
| Month/Year | Number of farms visits entered in the online form | Farms with health disorders (# and %) |
|------------|---|---------------------------------------|
| 07-2015 | 488 | 192 (39) |
| 08-2015 | 527 | 169 (32) |
| 09-2015 | 506 | 196 (39) |
| 10-2015 | 691 | 300 (43) |
| 11-2015 | 864 | 357 (41) |
| 12-2015 | 1166 | 545 (47) |
| 01-2016 | 2638 | 1203 (46) |
| 02-2016 | 2694 | 1179 (44) |
| 03-2016 | 2669 | 1179 (44) |
| 04-2016 | 2757 | 1140 (41) |
| 05-2016 | 2793 | 1107 (40) |
| 06-2016 | 2846 | 1071 (38) |
| 07-2016 | 3036 | 1098 (36) |

Figure 2. Example of the results provided in the monthly report.



Several phone calls were received regarding an observed increasing number of fertility problems in sows in the last four weeks. An analysis of the syndrome 'fertility' and underlying specific symptoms entered in the Online Monitor indicated indeed increasing trends in specific regions of the country. Figure 3 illustrates these increases in several regions in May and June 2016. In previous years increases of fertility problems in sows were observed in the period August-October. Even though the increase in fertility problems was sooner than expected, it was not likely that there was only a single (infectious) cause. Therefore no action was taken, but the trend was closely monitored. In the period August-September 2016 the increasing trend of fertility problems was depicting the normal seasonal trend in sows.

Figure 3. Percentage of farms in which fertility disorders were observed in sows in May-August 2016.



Discussion and conclusions

In this document we have briefly outlined the new online platform to collect data on swine health in the Netherlands. The Online Monitor Porcine Health is an internet-based reporting system that derives its data from the obligatory visits that veterinary practitioner pay every four weeks to pig farmers.

This tool represents one of the sources of information used by GD Animal Health to boost the surveillance system of swine health. A comprehensive range of information about clinical

signs and organ systems failures is collected at farm level and then aggregated and interpreted to provide a monthly report about trends and developments in health disorders per pig category in each region of the country.

After an initial voluntary phase, the system has now become compulsory and it is integrated in the quality assurance schemes for farmers and veterinarians. It is expected that with more data collected over time it will be easier to follow trends and developments in health issues in each pig category and geographical area. In future, this might predict the spread of pathogens and support risk mitigation measures. Besides, by getting a better picture of trends in pig health this system could have the ability to justify variations in antibiotic use over time.

The adoption of this system has the potential to result in standardised input for a veterinary syndromic surveillance system. Moreover, the combination of this additional data source and the ones already in use, such as the phone calls to the Veekijker helpdesk and post-mortem examinations, would be very useful in the case of emerging diseases. In those cases, for which a list of clinical signs and etiology would not be available, the unspecific signs detected early in the process of disease emergence would be reflected in several datasets and evidence could be pooled to enhance disease detection.

Reference

1. **GD Animal Health.** 2016 www.gddiergezondheid.nl/producten%20en%20diensten/veeonline/veeonline-voor-varkenshouders

Acknowledgments

We thank all the farmers and veterinary practitioners that provided information as well as input to set up and improve this new online monitoring platform.