Benchmarking the way to better biosecurity with a new digital tool

Almost one-third of all pigs in The Netherlands are located in the north-east part of the country where I work as a veterinary practitioner advising farmers on their pig health issues.

by Pieter Van Rengen, Lintjeshof Veterinary Practice, The Netherlands.

The virus responsible for the Porcine Reproductive and Respiratory Syndrome (PRRS) is an ever-present threat in this area. Beating PRRS at farm level is always difficult, but my experience over the past year has convinced me that results can certainly be improved with the help of a new tool to evaluate each herd's management practices for internal and external biosecurity.

The innovation is one devised by PRRS specialists on the swine health team of Boehringer Ingelheim Animal Health. They call it Combat, from the initials of Comprehensive Online Management Biosecurity Assessment Tool. It is a digital approach available online and as a smartphone app, that starts with a list of carefully chosen questions for the farm owner and personnel to answer about the routines they follow relating to biosecurity.

These aspects range from external considerations beyond the boundary fence to within-site factors such as the pattern of pig flow and the movement of people and materials between compartments.

Crucially, when the answers are entered directly on the computer or smartphone, the first results of the evaluation are displayed almost immediately and are in a visual format that clearly shows areas for potential improvement.

I had previously tried several other electronic methods that have been produced for evaluating individual management points on the farm and for giving an overview of the impact on health protection. Some of them can be very good. Where the new tool wins, in my opinion, is in its practical application.

The simplicity and short length of its questionnaire are important differences. In its standard form this has 55 questions, which we as a veterinary practice have modified slightly to suit our own needs but without increasing the amount of time needed to answer it. We find that limiting the total to no more than 60 questions is about right for keeping the farmer's attention. On average the list of questions can be answered in about 40 minutes. I like to ask the questions verbally rather than everyone looking at the list on the computer screen as this allows me to tune each question to the particular farm situation and to steer the discussion.

Answers entered on-screen are given a risk rating electronically, based on solid evidence from research and from practical experience. I then like to make a return visit to the client to show the visual output from the results and discuss what changes to management might be beneficial for biosecurity on that site.

Table 1. Most relevant risks.

Location risks	
Has other pigs kept within 1 km distance	77%
Do not know PRRS status nearest kept pigs	90%
External risks	
Vehicle for animal transport is (high) risk	84%
Dead animal collection	100%
Internal risks	
No restriction on staff moving between areas	93%
Not required to change clothing and boots between production areas	45%
Management risks	
Put 'lightweights back'	90%
Quarantine period replacement gilts four weeks or less	87%

Quick comparison with other sites

From my perspective the greatest value from using Combat is that it creates an excellent basis for the veterinarian to have a detailed conversation about biosecurity with the client. The real energy for this dialogue comes from the fact that the farmer can not only see how his farm rates in terms of health risks, but also how it compares with other pig herds in the same area or further afield.

Combat is a digital approach to biosecurity available online and as a smartphone app.

Because, in the end, it is all about benchmarking. Other forms of survey might allocate a score to a herd to indicate how well it is doing, but the key point in Combat applications is its farm-to-farm benchmark comparisons expressed as percentages. For example, we can show a farmer that his result is reasonably good overall, while also demonstrating to him in a visual way that, say, 30% of our clients are doing a better job than him.

We have a Top 20 of client farms for high biosecurity/low risk and we challenge everyone to achieve that level. The graphics on Combat confirm this target and they can also let farmers see how they compare with herds internationally, if that is what they want.

When we analysed results for 31 Dutch sow farms that had been evaluated using Combat in 2017, it underlined the significance of their location as a risk in relation to PRRS. Over three-quarters of these sites were within 1km of another pig farm and 90% of their operators did not know the PRRS status of

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the neighbouring pigs. In fact only 10 of the 31 herds were definitely PRRS-negative. The other 21 were either classified as PRRS-unstable because of a recent positive test from PCR monitoring or their PRRS status had not been established.

PRRS is not always the biggest health problem facing pig farms in my region of The Netherlands, but it is a common occurrence after a disease such as flu and therefore needs constant attention. Most often it creates a bad start to life because piglets are born weak, although even those in good condition can be born PRRS-positive and spread the infection.

Alongside this are ongoing problems with Streptococcus suis which we do our best to control by vaccinating sows. But the protection from vaccination finishes by 6-7 weeks old and then the pigs must protect themselves. This may not be enough if a PRRS episode strikes, leaving a legacy of poorer growth performance from about eight weeks old.

It is worth noting in that context that the focus of Combat questions and answers over biosecurity can also apply beyond PRRS, to other endemic diseases including S. suis. In all cases the questionnaire is a further information resource from a veterinary angle, adding to the technical results of the farm, the clinical observations of the veterinarian and the farm's health history as shown by the monitoring data from laboratory tests of samples.

	Very high	High	Intermediate	Low
Location risks	68.3%	9.2%	0.5%	21.6%
External risks	24.8%	31.5%	21.6%	22.1%
Internal risks	27.1%	18.7%	12.5%	41.7%
Management risks	41.7%	20.6%	6.2%	31.5%

Table 2. PRRS risk classification overview.

Pinpoint common risks

Looking at internal risk factors, the 31-farm Dutch survey using Combat revealed that no fewer than 93% of the sites imposed no restriction on the movement of their workers between areas of production.

Such farms could cut the risk measurably by making sure that everyone followed a correct protocol of changing clothes and boots when moving from one compartment to another.

Revealed, too, was the widespread failure of the farmers to recognise the very high infection risk of putting lightweights back into a younger production batch. On 90% of sites this was done both at weaning and at the transfer of growing pigs to the finishing barn. The operators seemed to regard the health risk involved as being less important than acting to 'rescue' individual small piglets by holding them back and mixing them with a following group. Along similar lines we found 87% of the farms limited the quarantine period for incoming gilts to four weeks or less.

Just as advice should always be customised to the particular farm, however, our experience with the PRRS biosecurity questionnaire has underlined the necessity of asking the questions in a specific way in order to find an accurate answer.

The most important thing is to ask open questions without giving the possible answers in advance! The answers do need to be examined before they can be entered correctly in the questionnaire. For example, when people say clothes are changed between sections, do they mean usually or all the time? And are clothes and boots changed before entering another compartment, yet the people sit together in the same clothes when having a meal break? Similarly, do all the coveralls from the different production sections hang together on the coat rack?

At the start the question-and-answer sessions were rather slow, more due to our own inexperience than to the farmers' reactions. The sessions became more relaxed and comfortable, with more input into the phrasing of questions, by the time the first 30 or so client farms had been visited. The big change in this respect came when we had accumulated enough responses to make a reference database from which comparisons with other farms could be drawn.

Putting lightweights back into a younger production batch presents a high infection risk.

Some people had been reluctant initially to change how they operated their farm, but they could not argue when shown in which ways they were better than or worse than other farms.

I know from using Combat for a year or more that it has made a major difference to my ability to help clients improve their biosecurity versus PRRS, by providing tangible support of my professional opinion and by prompting many valuable conversations. While not all farms have improved their methods substantially after Combat, most have been a success story.

One farm in particular is PRRS-negative on PCR test data after about 18 months. We think that the process would have taken much longer without Combat.

It is important to follow the correct protocol for changing clothes and boots.

Promoting progress

Ultimately, of course, the whole objective of using Combat is to promote progress on the farm. The tool has been made available to 'strengthen the identification and resolution of potential biosecurity hazards as part of a five-step PRRS control program risk management process', to use the words of Boehringer Ingelheim. So it is far from being simply an academic exercise, we have seen that it offers real economic benefits such as in lower production losses due to PRRS and less usage of antibiotics against bacteria including Strep. suis.

Potentially one of the biggest gains, however, may arise from filling the information gap on pig disease in a region. Farmers need to be aware to what extent the PRRS virus and other pathogens are active in the vicinity, so they can take appropriate actions to protect their herd. ■