

Health

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Lower infection rates using a unique testing method

AeroCollect



Company profile

The proactive veterinary tool of the future has come one step closer. AeroCollect technology makes it possible to capture and analyse airborne bacteria and viruses, thus providing an indication of overall poultry flock health so the farmer can react to emerging diseases earlier.

Salmonella, Campylobacter, Gumboro and a long list of other diseases that can infect a chicken flock can now be detected much earlier. With the AeroCollect technology a farmer or veterinarian can easily collect an air sample to obtain an overview of emerging diseases in the entire flock.

“AeroCollect effectively captures bacteria and viruses directly from the air. This allows poultry producers to keep an eye on their flock, optimise their production and only medicate when, in consultation with a veterinarian, it is necessary. This means that the intensity of infection decreases and productivity increases,” says Julia Skov, Team Manager of the AeroCollect development team.



With AeroCollect, you get fast and accurate surveillance of diseases in animal herds.
Photo: FORCE Technology

Simple disease monitoring in barn environments

The technology is Danish, and it differs from other methods by using targeted PCR-based flock diagnostics. Using the AeroCollect technology, the producer can get an overall picture of the general state of health for the entire flock, from just one sample. To obtain similar information using traditional testing methods, you would need to take a combination of sock samples, swabs and blood samples, and perhaps even combine them with, e.g., organ samples. It is the simple logistics that makes all the difference.

“AeroCollect is a simple method for monitoring diseases in farm environments. The simple logistics and the ability to analyse numerous pathogens from just one inexpensive sample, makes it economically viable to monitor the flock for the most common diseases that impact productivity. This allows the farmer to detect diseases before clinical symptoms occur, and ideally, before the entire flock is infected and productivity decreases,” says Julia Skov.

“If, for example, you have a flock of 25,000 chickens, it gives a more representative picture of the health condition of the whole flock to be able to see which viruses and bacteria are in the air in the farm than e.g., blood tests from a few selected chickens,” she says.

Facts – how AeroCollect works

AeroCollect works by pulling a flow of air through a small sample chamber. When collecting samples, high voltage is applied to the test chamber. This creates an electric field across the sample chamber that captures and concentrates bacteria, viruses, and other microscopic particles in the sample chamber.

The sample chamber is then sent to the laboratory where the content is analysed for pathogens using a qPCR analysis. The results are ready within 1-2 hours.

Thoroughly documented effect

What is unique about the AeroCollect technology is that bacteria and viruses from both respiratory and digestive tract sources are collected in the same test, even pathogens which are not traditionally airborne have been successfully captured by AeroCollect as bacteria and viruses are attached to the dust particles.

For the 16 diseases that AeroCollect has been proven to detect, the method has proven to be at least as accurate as the traditional testing methods. The method is EN ISO 16140-02:2016 certified and accredited by The Danish Accreditation Fund, DANAK under the ISO 17025 standard.

Facts – about the AeroCollect technology

AeroCollect is a CE marked Danish technology that has been developed by FORCE Technology.

The technology is currently used in the mink and chicken industries, but it is also commercially available to the pig industry. It has also been demonstrated that the equipment can be used in cattle populations and the human pharmaceutical industry, but the technology is not yet commercially available for those areas.

Over 10,000 confirmed tests have been carried out using AeroCollect and the company has over 50 customers in 12 countries.

Diseases are detected before clinical symptoms appear

Subclinical diseases, i.e., diseases where the clinical symptoms are absent or so weak that they are not detected, often result in heavy losses to the individual producer, because often many rotations of chickens that are processed with slightly lower levels of productivity than expected, before the infection is finally detected.

“In fact, the total loss from subclinical disease is often higher than the loss from virulent infections with high mortality rates – precisely because there is such a long period of low

productivity before it is detected. With AeroCollect, you can detect the presence of pathogens before clinical symptoms are observed. A routine monitoring will therefore result in subclinical infections being detected quickly and thus not have a significant impact on production,” says Julia Skov.

Ideally, one would routinely test every group of chickens for the 5 or 10 most common pathogens so that these are detected either at the subclinical stage or at an early stage when infection appear. This will greatly minimise the costs associated with the diseases. It will also be possible to use the knowledge gained from AeroCollect about the intensity of infection in the current flock to optimise vaccination programmes for future flocks.

Facts – Diseases that AeroCollect can detect

Salmonella
Campylobacter
Infectious bronchitis virus
Infectious bursal disease, Gumboro virus
Fowl Adenovirus
E. coli
Staphylococcus aureus
Avian reovirus
Chicken anime virus
Chicken astro virus
Avian metapneumovirus
Pasteurella
Mycoplasma synovia
Avian influenza virus
Avian encephalomyelitis
Marek’s disease virus

Part of the veterinary toolkit of the future

AeroCollect samples can be stored in laboratories, thus allowing for a library to be constructed for all chicken farms in, for example, Denmark six months back in time. If all producers routinely submit samples, it will provide the authorities with a truly relevant tool in relation to the detection of common diseases, just as it would mean far better options for action when exotic diseases, such as avian influenza, is introduced in a country.

In fact, avian influenza has just been detected in Denmark, and if AeroCollect was already introduced, then the authorities could test all poultry populations in Denmark for avian influenza at just a few days’ notice from the time the most recent samples were received, and continue monitoring avian influenza outbreaks for the next couple of months, until the danger has passed. All of this could be implemented without having to collect additional samples – one would simply have to analyse the samples that were already in the “sample library” in the laboratory.

“We hope that AeroCollect can become a key part of future proactive veterinary tools where diagnostics move more towards a monitoring approach that catches more diseases at the subclinical stage. Resistance to antibiotics is also a growing problem – both in domesticated animals and humans – and the faster a poultry farmer can act, the fewer antibiotics he will be required to use. So hopefully, AeroCollect can also help to limit antibiotic resistance,” she states.

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