

# On the lookout for veterinary disease

The Russian Federal Center for Animal Health is using a suite of Tecan workstations to automate various aspects of its ELISA- and PCR-based diagnostic testing operations, as well as the manufacture of a range of diagnostic ELISA kits. With eight Freedom EVO® platforms, plus a number of readers, washers and microarray instruments, the Center relies on Tecan automated solutions to help guarantee the quality and reliability of its work.

The Russian Federal Center for Animal Health (FGBI ARRIAH), based in Vladimir, is an internationally recognized center specializing in the development of methods for the diagnosis and monitoring of infectious veterinary diseases. The Center carries out a wide range of activities, from basic research and participation in disease monitoring and control programs to production of veterinary diagnostic ELISA kits, as well as acting as a regional reference laboratory and participating in various international programs.

Surveillance plays a vital role in veterinary medicine, and monitoring of infectious diseases – such as foot and mouth disease and avian influenza – is central to FGBI ARRIAH's

role. The number of investigations carried out in this field is significantly increasing every year, so new approaches to testing are required to meet the throughput demands of these large-scale projects. Combining high throughput screening strategies with novel ELISA and PCR technologies, the Center has invested in several laboratory automation solutions from Tecan to ensure reliable and reproducible data for surveillance and epidemic control.

ELISA testing for infectious diseases is essential to FGBI ARRIAH's serological screening strategy, as this is the most effective, reliable and efficient way of performing large-scale testing for a wide range of diseases. Automation of ELISAs

with two Freedom EVOlyzer® platforms provides the Center with the sensitivity and reproducibility necessary to carry out effective disease monitoring, as well as significantly enhancing throughput by allowing simultaneous processing of up to fifteen 96-well plates, depending on the assay requirements. Automated liquid handling also helps to standardize protocols – particularly for international collaborative projects – and virtually eliminates the risk of human errors, providing increased process and data security. Natalia Mudrak, senior researcher in the Reference Laboratory for Viral Poultry Diseases, commented: "Before automation, we relied on manual dispensing techniques using single- and multi-channel pipettes; it was very time consuming. Automated liquid handling improves both the efficiency and accuracy of our methods, while reducing the amount of reagents we use and the overall cost of the tests."

The benefits of automated liquid handling have also been applied to FGBI ARRIAH's ELISA kit production. The Center manufactures a range of over 40 diagnostic test kits, predominantly for poultry diseases, which are used in regional and local laboratories across Russia. A Freedom EVO workstation equipped with a MultiChannel Arm™ 96 (MCA 96) and a Te-Shake™ module provides accurate and reproducible pipetting of disease antigens to ensure production of high quality ELISA plates.

Following the success of the ELISA testing regime, the Center has now switched to complete automation of its molecular diagnostic protocols, from nucleic acid isolation and reaction mixture harvesting to nucleic acid purification and sequencing.



The layout of each Freedom EVO platform is optimized for a specific application



Nucleic acid isolation is fully automated on two Freedom EVO 75 platforms using magnetic bead-based technology, allowing simultaneous processing of up to 48 samples in under an hour. Following isolation, the samples are transferred to a Freedom EVO 150 workstation for PCR reaction set-up. Primers, PCR matrix mixture and enzymes are housed in cooled carriers on the deck of the instrument, and are sequentially added to the samples to avoid non-specific fusions. Automation of this process gives researchers total control of dosing volumes while virtually eliminating the risk of cross-contamination. Finally, following PCR amplification, DNA purification for

sequencing is performed on a Freedom EVO 75. This system allows 96 samples to be processed in an hour and a half, significantly reducing the overall time required for the sequencing process.

“We also use Tecan equipment to develop and process DNA microarrays for genotyping a number of viruses that cause disease in birds,” Natalia continued. “We optimize the hybridization protocols and different buffer solutions with the fast HS 400™ Pro hybridization station, and scan microarrays with the LS Reloaded™ laser scanner, which is equipped with two lasers set up for the detection of Cy-3 and Cy-5 cyanine dyes.”

Natalia concluded: “Robotic liquid handling is vital to our work; the precision of pipetting is critical, as the reliability of all the measurements performed in the laboratory depends on the precise and accurate transfer of samples and reagents. This is why we chose Tecan’s Freedom EVO workstations.”

To find out more on Tecan’s veterinary solutions, visit [www.tecan.com/veterinary](http://www.tecan.com/veterinary)

To learn more about FGBI ARRIAH, go to [www.arriah.ru](http://www.arriah.ru)



The FGBI ARRIAH team relies on its Freedom EVO workstations for efficient processing of ELISAs and molecular diagnostic protocols