A guaranteed quick response to animal disease outbreaks in Austria

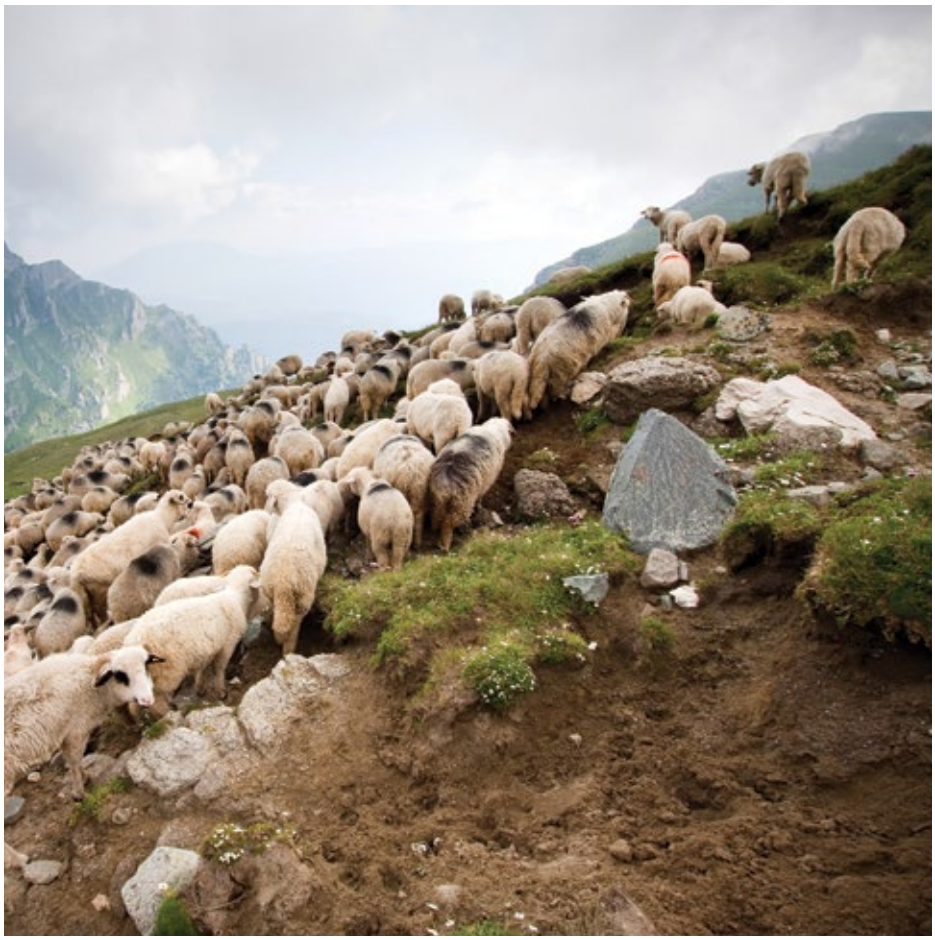
Molecular biologists at the Austrian Agency for Health and Food Safety have built a remarkably efficient and flexible laboratory workflow, using two Freedom EVO® workstations for automated nucleic acid extraction, in order to cope with a busy routine veterinary surveillance workload, as well as extra surges of samples from disease outbreaks all over Europe.

In 2002, Dr Sandra Revilla Fernández joined the Austrian Agency for Health and Food Safety (AGES) and single-handedly dealt with the Agency's annual molecular biology workload of just one thousand samples. Just ten years on, she runs a staff of 10 in what is now the national reference laboratory for more than 30 notifiable diseases, including foot and mouth disease, classical swine fever, bluetongue, avian influenza, bovine tuberculosis and brucellosis. Now part of the Institute for Veterinary Disease Control, the laboratory, based in Mödling, runs European Union surveillance programs and is responsible for the diagnosis of animal diseases that have serious economic implications, as well as those that are transmissible to the human population.

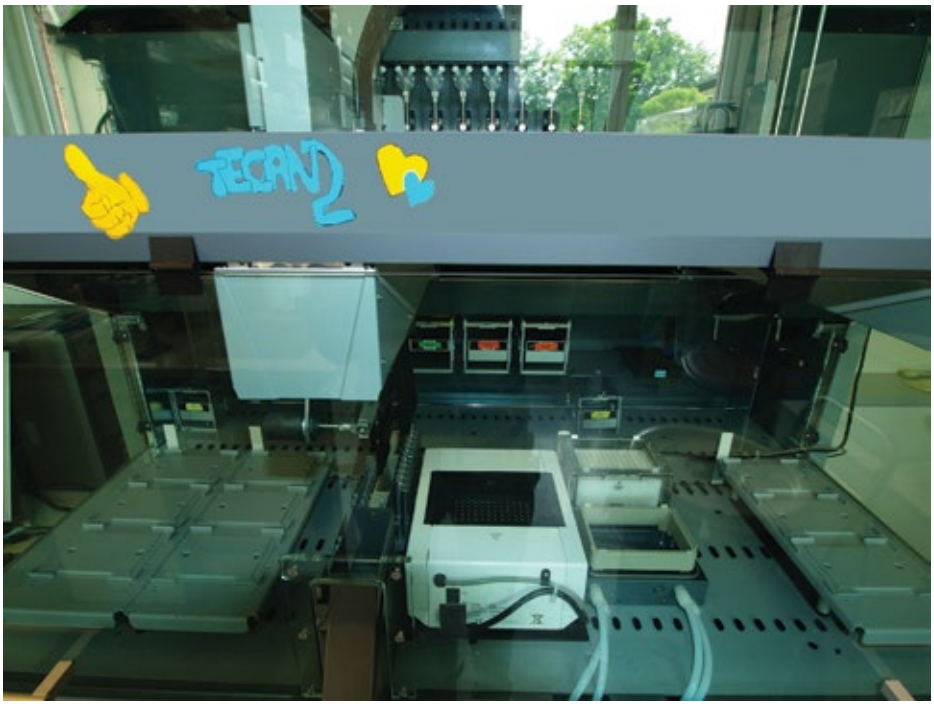
Sandra explained what triggered the laboratory's rapid development into the efficient facility it is now: "When I started here, my role was simply to confirm results from other laboratories, and vets were hardly even aware of molecular biology as a diagnostic tool. Then, at the end of 2005, there was a European-wide outbreak of the H5N1 avian influenza virus. We started a compulsory surveillance program set by the European Union and were receiving hundreds of dead wild birds every day. In 2006 we had 6,000 samples for avian flu alone, and we were still performing all our nucleic acid extractions by hand; it was crazy! We had to pull in extra staff from other laboratories and instantly realized that we would have to automate our laboratory as much as we could, as quickly as we could. Due to the urgency of the situation, and to conform to Austrian government regulations, we immediately contacted colleagues across Europe working in the same field, and followed their recommendations to buy a Freedom EVO 150 workstation. The choice of such an open, flexible platform suited me perfectly, because I knew that avian influenza was just the tip of the iceberg; molecular biology was increasingly being recognized as an important diagnostic discipline and I knew that our workload was going to significantly grow in the future."

In 2008, the laboratory bought its second Freedom EVO system, in response to an outbreak of bluetongue throughout Europe. Again, Sandra followed recommendations from European colleagues and wanted a system that could handle all sample types.

"A new surveillance program was about to begin using organ samples so it was very important that we had another flexible system that could prepare samples other than just blood. Avoiding cross-contamination whatever the protocol has, of course, always been very important for us and, on this occasion, we had the time to consider this more closely. We still found that the Freedom EVO systems were the best option, and were able to cope with this particular issue very well. Our range of protocols had also increased and we needed a liquid handling system that could automate



AGES copes with a busy routine veterinary surveillance workload



A second Freedom EVO system was required to cope with a European outbreak of bluetongue

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vacuum-based and magnetic bead-based methods, including the NucleoSpin® 96 Virus kit from Macherey-Nagel for extraction of viral RNA, which was also recommended by other laboratories and optimized for the Freedom EVO. We didn't have the time then to properly evaluate this kit ourselves, but have since performed proper validation procedures and, although we looked at other alternatives, we were pleased to find that this had been the right choice all along."

"Our workload now includes samples for import and export, as well as regular rushes of extra samples when outbreaks occur, reaching over 17,000 samples in 2012 and increasing every year. For this reason we have had to become extremely organized with our workflow, and have more than 30 standard operating procedures. The laboratory has been accredited since 2003, which has helped us to analyze our working environment and processes, and we are continually finding ways to improve efficiency. Tomorrow morning, we are expecting 200 samples that need to be finished by midday, and this is not unusual. The extraction protocol takes around two hours on the Freedom EVOs, and that leaves us with a further two and a half hours for real-time PCR. The two instruments are situated away from the main laboratory and we have a baby alarm next to them to let us know when the samples are ready to collect, as well as to alert us of any errors, although this is rare as they are so reliable. There is certainly no need for a member of staff to sit alongside and supervise the instrument, which is especially important for us in this situation. For some laboratories this turnaround time would be impossible but, with our two Freedom EVO systems and a super-efficient workflow, we know we will have the results ready on time!"

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To find out more about AGES, visit **www.ages.at**

Sandra (front left) with members of the molecular biology team