

Feeding the Russian biotech market

Russia has been a fast-growing region for biotechnology and life sciences in recent years, with food and agriculture being key focus areas. Here is a snapshot from laboratories looking at the contrasting roles of microbiology in food production, both employing Tecan equipment in their workflows.

The Soyuzsnab Group of Companies is the largest supplier of food ingredients in Russia, and its portfolio includes the manufacture of food products from raw materials, the synthesis of flavorings, and the development of novel biotechnologies for food production. The development of sourdoughs and protective cultures for the meat, dairy and agricultural industries is an area of particular importance to Soyuzsnab, and the Company continuously invests in developing its strain collection in order to meet the changing needs of its customers. Until 2011, Soyuzsnab's Biotechnology Laboratory used extremely time-consuming and labor-intensive manual microbiological methods for strain maintenance and manipulation, before purchasing a Freedom EVO® 150 system to increase efficiency.

The workstation is configured for rapid screening of micro-organisms of interest in a

96-well format, and includes a Pickolo™ module for colony picking, an Infinite® F200 PRO multimode microplate reader and an integrated incubator. In a single experiment, the team can screen 96 different strains for characteristics such as salt and acid resistance (important for the production of cheese and sausages), growth rates, acid formation, resistance to bile and alkalis (important for probiotic cultures) and the formation of aromatic compounds, as well as investigating suitable growth media.

The increased throughput offered by the Freedom EVO platform means that the Biotechnology Laboratory is using the system for a number of other applications, such as investigating random mutagenesis as a way of improving cultures. In addition to its normal application of transferring colonies to microplate wells, the Pickolo

module is also being used to spot colonies onto targets for MALDI-TOF analysis, allowing the team to simultaneously look at species identification and characterization in one experiment.

For all these applications, the operator simply needs to load the worktable and identify the colonies of interest either by manual selection or using predefined profiles. The method then runs automatically, with data available to analyze just a few hours later. Pavel Vyushinsky, Biotechnology Engineer at Soyuzsnab, commented: "We are very satisfied with the speed of our Freedom EVO workstation, which has taken on the workload of three skilled employees. It has also given us the ability to carry out long-term analysis of the physiological characteristics of micro-organisms in a 96-well format, which was not feasible before we had the system."



The Pickolo module offers fully automated colony picking, plate seeding and MALDI spotting for Soyuzsnab

The All-Russian Plant Quarantine Center is also using a Freedom EVO workstation in combination with an Infinite F200 PRO, this time using a NanoQuant Plate™. Part of the Federal Service for Veterinary and Phytosanitary Surveillance, the Center is the national plant protection laboratory, and is responsible for providing training to plant health and quarantine specialists from around the world, as well as the development of many procedural guidelines for the detection and control of plant pests and pathogens.

The Bacteriology and Molecular Methods Laboratory specializes in the detection and identification of quarantine pests, such as the causative agents of fire blight (*Erwinia amylovora*), brown bacterial potato wilt (*Ralstonia solanacearum*) and corn bacterial wilt (*Pantoea stewartii* subsp. *stewartii*), as well as performing genetic testing for other laboratories within the Center. More than 9,000 samples are investigated by the Laboratory every year from across Europe, Africa, North and South America, as well as from Russia, using immunofluorescence, enzyme immunoassays, cultural and morphologic examination, biochemical techniques and molecular genetics.

With such a high workload, the Laboratory invested in a Freedom EVO workstation with a Te-MagS™ module to automate routine sample preparation and speed up the screening of crop samples. The system carries out nucleic acid purification for 48 plant samples in parallel using reagents from Russian manufacturers Syntol and Biokom, as well as performing pre-PCR processing for sequencing on an Applied Biosystems 3500 sequencer (Life Technologies).

Automating the process in this way has freed up two full time researchers to perform other tasks, significantly reducing purification



The All-Russian Plant Quarantine Center's Bacteriology and Molecular Methods Laboratory team

costs per sample. Konstantin Kornev, Head of the Bacteriology and Molecular Methods Laboratory, explained: "A big advantage of the Freedom EVO platform is that it has allowed us to avoid the PCR inhibition often caused by starch and soil impurities, which was not always possible with manual extraction. The combination of the Freedom EVO with our Syntol and Biokom reagents has also further reduced the cost of extraction per sample, which is important for us."

In 2013, the Laboratory also purchased an Infinite F200 PRO NanoQuant to allow them to quantify DNA in up to 16 purified samples at once, alleviating another potential bottleneck in the workflow and greatly improving sample throughput. The quality of DNA from this process is now so good that it can be used for various downstream PCR and sequencing activities, contributing

significantly to the Center's groundbreaking work in the investigation of plant pests. Konstantin concluded: "We really like the speed of the workstation, its accuracy and the quality of the DNA produced."

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For more information on the All-Russian Plant Quarantine Center, visit www.vniikr.ru