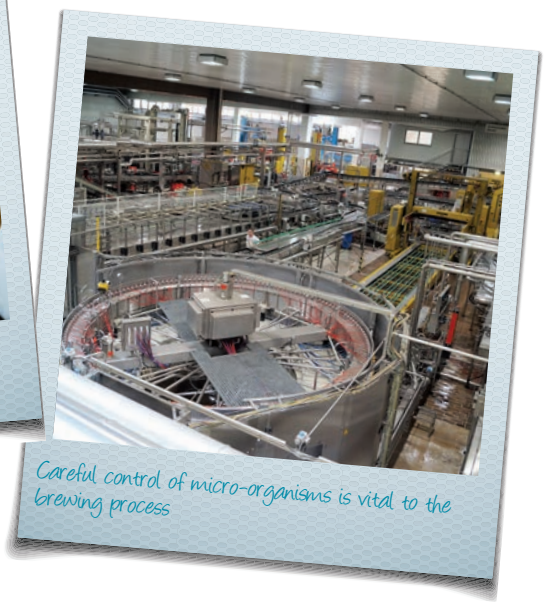
Monitoring the quality of beer – a unique collaboration

Tecan has collaborated with HLFS Ursprung and the Stiegl brewery to optimize the HybriScan™*D* Beer method for the quality control of micro-organisms affecting the taste of beer on an Infinite® M200 PRO multimode reader.

Höhere land- und forstwirtschaftliche Schule Ursprung (HLFS Ursprung), based in Salzburg, Austria, is a residential school dedicated to providing a science-based secondary education focused on the fields of agriculture and environmental engineering. Students from across Austria come to the school to study alongside others with a similar interest in science and, during the course of their studies, have the opportunity to take part in Jugend Innovativ, a highly regarded national competition that provides a platform for young scientists to present the results of novel research projects. HLFS Ursprung collaborated with Tecan Austria and the Salzburg-based Stiegl brewery to establish a rapid molecular test on the Infinite M200 PRO reader, achieving a creditable 3rd place from 32 entries in the science category of this prestigious competition. Bernhard Stehrer, a science teacher at HLFS Ursprung, explained: "In addition to their regular lessons, students can voluntarily undertake scientific projects, such as participating in the Jugend Innovativ competition, during their leisure time. Those who participate are highly motivated and spend many hours working on their experiments; it is wonderful to see them getting so involved in science, and very rewarding. HLFS Ursprung has participated in the competition for many years, and we find it really stimulating for our students; they learn so much from taking part. They must plan and execute their project, requiring critical thinking and the ability to work to set deadlines, which is good training for the future. Students also have to present their work to an external jury and answer questions about the science involved, which is a whole new experience for them."

A brewery tour provided the students with an understanding of the practical applications of the project

"This year, we wanted to investigate the science behind food production, combining it with quality assurance of the end product. As our students study molecular biology, we looked for a project that would allow them to explore a specific application in this area, and decided on the quality control of beer. Micro-organisms are a necessary part of the brewing process, but they can also ruin the beer; careful control of micro-organisms is therefore crucial. We approached Stiegl, a large private brewery in Austria that we had previously worked with, as we knew that the Company was very open to new ideas and educational initiatives. Stiegl provided samples for analysis and showed us the methods used in its laboratory, which involve assessment of cultures under a microscope. It can take a long time to acquire sufficient experience to confidently assess cultures this way, and we felt that molecular methods might be faster and easier to learn. To help us with this project, we needed someone familiar with modern techniques and cutting-edge technology, and so we contacted Tecan."



Careful control of micro-organisms is vital to the brewing process

Julia Füreder, a Concept Engineer at Tecan Austria, took up the story: "I had previously worked with the school, and was happy to participate again. The students are really hard working and have an immense scientific knowledge; it is lovely to collaborate with them. We did some research, and discovered the HybriScan*D* Beer assay (Sigma-Aldrich), a rapid molecular test using photometric detection. I immediately thought of the Infinite M200 PRO, and Tecan agreed to support the study."

The Jugend Innovativ project team

The students gained valuable hands-on experience of running the assay

sensitive and time saving and, from a technical point of view, easier to perform. It also avoids the need for cultivation, generating results in hours, which is a huge benefit."

Ludwig Mühlhofer, Head Research and Development at Stiegl, added: "It was both interesting and important for Stiegl to work with the new molecular method, comparing it to microbiology, and it was really nice to see the enthusiasm and the effort of the project team. In the future, it would be good to increase the degree of automation, further improving handling of the process."

Tecan staff joined the HLFS Ursprung teachers as mentors for the project

Julia continued: "Everyone was so enthusiastic. The students took full responsibility for the project, which took about two months to complete, with myself, a colleague from Tecan, Dr Katrin Flatscher, and the HLFS Ursprung teachers acting as mentors. Students designed experiments to reduce the 24-hour pre-enrichment time, as well as a method for detecting foreign yeast, which causes the quality of the beer to deteriorate. Katrin and I worked with the pupils, showing them how to set up and use the Infinite reader, and they soon picked it up; by the end of the project, they were experts!"

"The results were really good, and compared well with those of the brewery. Microbiological methods require culturing of micro-organisms, colony picking and microscopic examination, which takes days rather than hours. The students demonstrated that the new method is both

The success of the collaboration was summed up by Bernhard, who said: "The wonderful thing about having this opportunity to work with Tecan and Stiegl is that the students gain experience of science in the context of work, enabling them to learn about targeted research and production processes, and to see that their work has a purpose and offers benefits for other people. They know that they have contributed to a process improvement, and that is a fantastic feeling."

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To find out more about Tecan's Infinite M200 PRO reader, visit **www.tecan.com/infinite200pro**

To find out more about HLFS Ursprung, visit **www.ursprung.at**

To find out more about the Stiegl brewery, visit **www.stiegl.at/en**