Analytical profile Wine Quality (Changins)

The **Wine Quality** research group (13.5) has the following tasks:

- Analytical services for viticulture and oenology research projects of Agroscope
- Analytical services provided under contracts for two external customers
- Analyses to inspect wine intended for export (mandate of the Swiss Federal Office for Agriculture (FOAG)
- Implementation of own research projects in the fields of analysing grapes, musts and wines in collaboration with viticulture, oenology and mycology research groups as well as with the School of Engineering at Changins and other national and international partners (universities, Bordeaux, Geisenheim)
- Collaboration in the work of national (FSVO, Federal Food Safety and Veterinary Office) and international commissions (International Organisation of Vine and Wine (OIV) to update or validate analysis methods and adapt national and international standards and references.
- Analytical assistance to project managers, scientists, organisations and institutions (FOAG, FSVO, cantonal services, analytical laboratories, winemaker associations)
- Organisation of national interlaboratory comparison tests in the field of wine analysis

The analytical services offered by the Wine Quality research group for the needs of the different research projects are as follows:

Analyses of musts and wines

- Routine analyses (FTIR-Winescan analyses, autoanalyzer, etc.) and specialised analyses (GC-HPLC) of wine material originating from wine-growing and oenological experiments for the IPS research groups and for our group. These analyses relate to monitoring grapes as they ripen, analyses of harvest batches (crushing) from different parcels of land in Agroscope vineyards in Romandie (Changins, Pully, Leytron) and the Canton of Ticino (Gudo, Cugnasco), and monitoring the wines as they ripen (musts, maturing wines and bottled wines).
  The results of these analyses are used as scientific data for the benefit of the proper management (technical decisions) of the wine-making processes, for which the proximity, responsiveness and speed of the analysis are essential.
- Routine analyses of wines for three external customers provided under a contract (FTIR-Winescan analyses + autoanalyzer)

Sensory evaluation

- Computerised preparation of tasting sessions and evaluation of the results.
- Members, jointly with employees of the groups Viticulture and Oenology at Agroscope, of the in-house sensory evaluation panel.

Microbiology of wines

- Basic microbiological analyses (microscopy, culturing) to monitor different ripening processes and, in some cases, to inspect wines for export.

Analytical inspection of wines for export

- Laboratory accredited under ISO/CEI 17025, carrying out official inspection analyses on wines intended for export (reference methods and according to the importing country: alcohol, pH, total acidity, volatile acidity, citric acid, SO_2, sugars, sorbic acid, natamycin, methanol, ash, microbiology) on behalf of FOAG and wine exporters.

Adaptation and development of analysis methods for musts and wines

- Adaptation and validation of reference analysis methods in the field of grapes, musts and wines (collaboration with FSVO and OIV)
- Analyses relating to improving and developing methods for identifying and quantifying quality markers for grapes and wines (sulphur compounds, phenol compounds, aromatic precursors, decay indicators, etc.)

Analytical equipment and techniques

- 1 FTIR – Winescan
- 2 sequential analysers for enzymatic and chemical analyses
- 1 UV/VIS spectrophotometer
- 1 density meter Paar
- 2 automatic titration systems: pH, total acidity, chemical sugars, volatile acid, SO_2
- 3 distillation ramps (Franz Paul SO_2, alcohol, volatile acid)
- 1 gas chromatograph – FID/FPD
- 1 HPLC-DAD (single quadrupole mass spectrometer, borrowed), 1 ionic HPLC
- 1 HPLC-MS-MS triple quad
- 1 autoclave, 1 optical microscope, 2 incubators
- 16 computer terminals for tasting sessions, FIZZ® program

Infrastructure

- 5 laboratories with fume hoods

Unique characteristics

- Proximity of the analytical facility to IPS research groups (Viticulture, Oenology, Mycology) ensuring the responsiveness and efficiency needed to manage research programmes properly
- Analytical specialisation ensuring very good understanding of the material to be analysed (grapes, must, wine), an essential element in the reliability of analytical results and the speed with which they are obtained
- Laboratory accredited under ISO/CEI 17025 and commissioned by FOAG with the official inspection of wines for export
- Members of the Sub-Commission ”Methods of analysis” of the International Organisation of Vine and Wine (OIV) and the working group on the Swiss Food Manual (SFM) issued by the FSVO, section on wine for monitoring and updating analysis methods
- Organisation of interlaboratory tests for Swiss laboratories active in the field of wine analysis
- Well-developed complementarity in chemistry as part of the joint research unit (unite mixte de recherche - UMR) with the School of Engineering at Changins (Bachelor or Master degrees, lecturing, shared equipment)

- Involvement in viticulture & oenology developments providing important support/advice to politics (FSVO - SFM, FOAG), institutions and organisations (cantonal services, laboratories), and to our external customers (wine exporters, cellars)