



Wine-Profiling™ 4.0

- Fast, Reliable Authenticity & Quality Analysis

Innovation with Integrity

NMR

Fraud in the Wine Industry

While in recent years, wine consumption has decreased, consumers still perceive wine as a natural and authentic beverage. The trend is showing that while consumption is down, revenue is stable. Meaning that people are spending more for better quality wine. The main criteria among consumers in choosing a quality wine are the region, followed by the denomination of origin, and finally the grape variety, to the detriment of the wine grower. Therefore, the incentive to defraud wine and increase profit is high.

Unfortunately, the detection of fraudulent wine related to false DO declarations, regions or grape varieties has been very challenging due to a lack of analytical methods available. The consequences of wine fraud are devastating for the wine growers because they erode the consumers' confidence in DO, regions or grape varieties, leading to a plummet in sales. Bruker's Wine-Profiling solution is an innovative and powerful way to detect and prevent wine fraud.

List of parameters that are quantified in wine with Wine-Profiling™ 4.0

Standard Parameters	Degradation Parameters	Amino Acids	(Poly-)phenols	Stabilizing Agents	Higher Alcohols / Fermentation Products
Arabinose	Acetic acid	4-aminobutanoic acid	Caftaric acid	Benzoic acid	1,3-propanediol
Bread units*	Acetoin	Alanine	Epicatechin	Salicylic acid	2,3-butanediol
Carbohydrate units*	Cadaverine	Arginine	Gallic acid	Sorbic acid	2-methyl-propanol
Citric acid	Ethylacetate	Proline	Shikimic acid	Shikimic Acid	2-phenylethanol
Energy value*	Ethylactate		Trigonelline		3-methyl-butanol
Ethanol	Formic acid				Acetaldehyde
Ethanol-vol%*	Fumaric acid				Galacturonic acid
Fructose	Furfural				Glycerol/Ethanol*
Glucose	Gluconic acid				Methanol
Glucose/fructose*	HMF				Pyruvic acid
Glycerol					
Lactic acid					
Malic acid					
Must weight*					
Sucrose					
Sugar-free extract*					
Tartaric acid					
Total alcohol*					
Total alcohol-vol%*					
Total extract*					
Total fermentable sugar*					
Total sugar (bef. inv.)*					

*Calculated values



Due to its unique “all-in-one” capabilities, high-resolution 1H-NMR (Nuclear Magnetic Resonance) spectroscopy, combined with multivariate statistical chemometrics, is a powerful tool for testing the authenticity and quality of wine.

Wine-Profiling can detect several hundred compounds in a wine sample simultaneously, which are used to characterize the wine through a comprehensive database of reference wines. The database is routinely updated with new variants for grape variety and geographical verification, providing a reliable, up-to-date, reference library.

Origins that can be verified with Wine-Profiling 4.0

Countries	Regions	Appellations*
France	Bordeaux	
	Burgundy	AOC Chablis
	Languedoc-Roussillon	
	Loire Valley	
	Provence	
	Rhone Valley	
	South-West France	
Italy	Piedmont	
	Puglia/Apulia	
	Sicily	
	Tuscany	DOCG Brunello di Montalcino
Spain		DOC Valpolicella
		DO Navarra
		DO Rias Baixas
		DO Ribera Del Duero
		DO Ribera Del Guadiana
		DOCa Rioja
		DO Rueda
Austria		
Germany		
Chile		

*An appellation is a legally defined and protected geographical indication used to identify where the grapes for a wine were grown.

Grape varieties that can be checked in monovarietal wine



Barbera		Alvarinho/Albarino
Cabernet Sauvignon		Chardonnay
Dornfelder	Dornfelder	Chenin Blanc
Garnacha/Grenache		Moscatel
Merlot		Müller-Thurgau
Monastrell/Mataró/Mourvèdre		Pinot Blanc*
Montepulciano		Pinot Gris/Pinot Grigio/Grauburgunder*
Nebbiolo		Riesling
Pinot Noir	Pinot Noir	Sauvignon blanc
Portugieser Blau	Portugieser Blau	Silvaner/Sylvaner
Primitivo/Zinfandel		Veltliner Gruen
Sangiovese		Verdejo
Syrah/Shiraz		Viura/Macabeo
Tempranillo	Tempranillo	Welschriesling
Zweigelt	Zweigelt	

* Pinot Blanc and Pinot Gris cannot be differentiated

With Wine-Profiling 4.0 You Can:

- Check origin consistency: country, region, appellation* (e.g. DO, AOC)
- Check grape variety consistency of monovarietal wines
- Check quality grade consistency of Spanish red wine
- Check vintage consistency of white wines from the three previous years
- Analyze composition of wine
- Detect atypical samples by comparison to reference wine samples
- Detect addition of water to wine

Advantages of Wine-Profiling 4.0:

- Comprehensive screening of authenticity in one method.
- Analysis takes 20 minutes
- Fully automated method, no NMR expertise is required.
- The comprehensive and robust database of reference wines covers many origins and grape varieties. It was developed in partnership with Winespin-Analytics, Eurofins Analytics France and Estación Enológica de Haro.
- ISO17025-18 accreditation. The Bruker BAS laboratory is accredited for Wine-Profiling 4.0, guaranteeing extensive validation of all the underlying tests.

Bruker's FoodScreener

- Wine-Profiling is a module of the FoodScreener™ platform.
- The FoodScreener is also compatible with Juice and Honey-Profiling analysis modules.



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