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WINE ANALYSIS

Enzymatic bio-analysis plays a vital role throughout the whole of the wine-making process:

Before the alcoholic fermentation begins, the nutritional status of the grape juice is determined to ensure optimal growth conditions for the yeast. This includes an estimation of yeast available nitrogen as the product of free ammonia, primary amino nitrogen and L-arginine, and the principle fermentable sugars D-fructose and D-glucose.

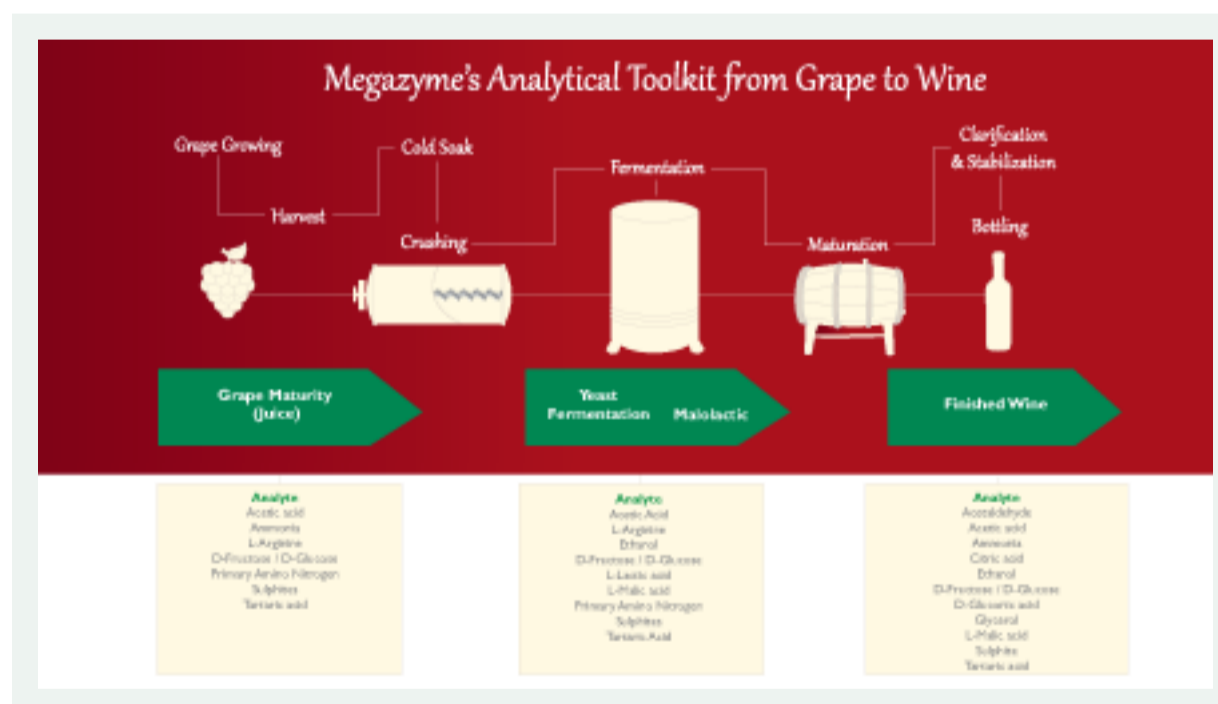


During the alcoholic fermentation, the level of acetic acid is monitored to detect infection by *Acetobacter sp.* and the level of urea is determined in order to establish whether the wine should be treated by the addition of urease to eliminate the risk of forming the carcinogen ethyl carbamate. Concentrations of acetaldehyde, ethanol, glycerol and succinic acid all rise throughout the alcoholic fermentation phase of the vinification process.

If it is elected to perform a malolactic fermentation, the falling level of L-malic acid and rising level of L-lactic acid are monitored. The falling level of citric acid can also be determined.

[Find out why your winery should be testing in-house and how Megazyme can offer an analytical solution.](#)

Numerous analyses are performed in order to determine the quality, stability and authenticity of wine after fermentation is complete, and include enzymatic assays for: acetaldehyde, acetic acid, L-ascorbic acid, ethanol, ethanol/glycerol ratio, D-fructose, D-glucose, D-fructose/D-glucose ratio, glycerol, D-gluconic acid, D-gluconic acid/ethanol ratio, D-gluconic acid/glycerol ratio, L- and D-lactic acid, L- and D-malic acid, D-sorbitol, succinic acid and urea.



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Analyte	Cat. No.	Analyte Significance	Advantages Of Megazyme Test Kits
Acetaldehyde	K-ACHYD	A sensory compound that adds flavour and complexity, but spoils wine at high concentrations	AcDH supplied as a stabilised solution rather than a lyophilised powder, thus less wasted enzyme
Acetic Acid	K-ACET K-ACETAF K-ACETAK	A sensory compound that adds flavour and complexity in small amounts, but spoils wine at high concentrations. Produced naturally by yeast in small amounts and by spoilage organisms such as	All kits contain PVP to prevent tannin inhibition. K-ACET (manual, efficient) contains stable ACS suspension. K-ACETAF (auto) used to prepare very stable R1 and R2. K-ACETAK (auto) / K-ACETRM (manual) are very rapid

	K-ACETRM K-ACETGK	Acetobacter aceti in large quantities. This is the predominant of the acids comprising ~ 85 % volatile acidity (VA)	acetate kinase (AK) based kits with excellent linearity. K-ACETGK is a new rapid, auto-analyser assay kit employing AK and phosphotransacetylase. Stable reagents
Ammonia	K-AMIAR K-LARGE	Most important inorganic source of Yeast Available Nitrogen (YAN)	Novel enzyme employed is not inhibited by tannins, endpoint reaction time ~ 3 min. Ideal for manual and auto-analyser applications
L-Arginine	K-LARGE	Most important amino acid in grape juice with respect to YAN	Simple and rapid test kit gives sequential values for ammonia, urea and L-arginine. No tannin inhibition
L-Ascorbic Acid	K-ASCO	Present naturally in grapes and can be added as an anti-oxidant	Rapid reaction, stable reagents
Citric Acid	K-CITR	Naturally present in small amounts; large amounts indicate addition for acidification (EU limit is 1 g/L)	Ideal for both manual and auto-analyser applications. Reconstituted citrate lyase stable for > 6 months at -20°C. Stable reagents
Ethanol	K-ETOH	Produced during alcoholic fermentation. Amounts > 17.5 % (v/v) indicate supplementation	Rapid reaction, stable reagents (AIDH supplied as a stable suspension)
D-Fructose / D-Glucose	K-FRUGL K-FRGLMQ K-FRGLQR	Grape quality indicator. One of the two principle fermentable sugars of grape juice	Contains PVP to prevent tannin inhibition. Ideal for manual and auto-analyser use. Stable reagents
D-Gluconic Acid	K-GATE	Grape quality indicator for the production of certain wines	Rapid reaction, stable reagents
Glycerol	K-GCROL K-GCROLGK	Quality indicator of finished wine, important for “mouth feel”	Novel tablet format offers superior stability, rapid reaction
D-Lactic Acid	K-DATE K-DLATE	Produced predominantly by lactic acid spoilage bacteria	Rapid reaction, stable reagents
L-Lactic Acid	K-LATE K-DLATE	Produced predominantly from L-malic acid during malolactic fermentation	Rapid reaction, stable reagents. Ideal for manual and auto-analyser applications
D-Malic Acid	K-DMAL	Only present in significant quantities in adulterated wine	D-MDH supplied as a stabilised suspension rather than a lyophilised powder, thus less wasted enzyme
L-Malic Acid	K-LMAL K-LMALAF K-LMALMQ K-LMALQR	Grape quality indicator. Very important grape acid, converted to less acidic L-lactic acid during malolactic fermentation	All kits contain PVP to prevent tannin inhibition. 1. K-LMALR/L (manual) rapid reaction 2. K-LMALAF (auto) rapid reaction, excellent linearity 3. K-LMALMQ (manual, colorimeter based) 4. K-LMALQR (auto) liquid ready reagent
Primary Amino Nitrogen (NOPA)	K-PANOPA	Primary amino nitrogen (PAN) is the most important organic source of YAN	Novel kit, rapid reaction, stable reagents, simple format
D-Sorbitol	K-SORB	High levels indicate addition of fruit	Diaphorase supplied as a stabilised suspension rather than a lyophilised powder, thus less wasted enzyme
Succinic Acid	K-SUCC	Wine acid produced during fermentation	Rapid reaction (~ 6 min even at room temperature), stable reagents
Sucrose	K-SUFRG K-SUCGL	Added to increase the amount of alcohol. Use only permitted in certain situations	Choice of simple formats available, based either on glucose oxidase / peroxidase, or hexokinase / G-6-PDH
Sulphite	K-SULPH K-FSULPH K-TSULPH K-ETSULPH	Sulphites are used as an essential additive in the control of microbial contamination during aging and to also protect the wine against detrimental “oxidative and enzymatic browning”	Choice of simple formats available, based either on liquid ready reagent chemical reactions (K-SULPH, K-FSULPH & K-TSULPH) or an enzymatic reaction (K-ETSULPH). Stable reagents
		Occurs naturally in grapes and is one of the most	Stable liquid ready reagents. Simple, rapid chemical reaction

Tartaric Acid	K-TART	prevalent organic acids. Key indicator of total (titratable) acidity (TA)	for manual, auto-analyser and microplate formats
Urea	K-URAMR	Source of YAN and precursor of the carcinogen ethyl carbamate. Over-supplementation with DAP can result in elevated levels	Simple, very rapid (both urea and ammonia measured in < 10 min at room temperature) and sequential / efficient (only one cuvette required per sample)

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