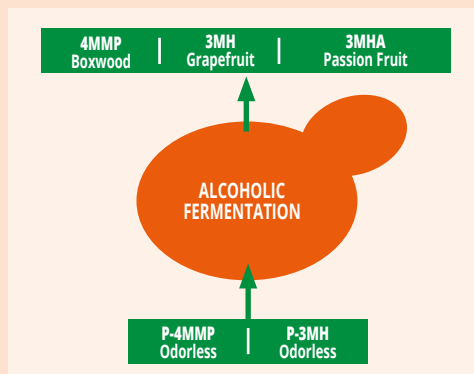


YEAST AND THIOLIC VARIETIES

THE ROLE OF YEAST

In grapes, 4MMP and 3MH are present in the form of odorless precursors bound to cysteine or glutathione. Their release in odorous form occurs during alcoholic fermentation by yeast endocellular β -lyases that break the bonds between cysteine or glutathione and the thiolic compound. The formation of 3MHA, on the other hand, always requires yeast activity through a mechanism of acetylation of 3MH. The expression of the thiolic aromas is closely related to the enzyme activity of yeast. Genetically different yeasts show a different ability to produce volatile thiols and to modulate both the intensity and aromatic profile of wine accordingly.



The influence of thiols in increasing wine aroma is the result of the combination of grapes and yeast. Through research, it has been found that thiol precursors are present in many white and red grape varieties, but it is the yeast, with their enzymatic activities, that are truly responsible for the transformation of these odorless precursors into volatile aromas with characteristic scents of tropical fruit, citrus and boxwood.

THIOLS

Thiols are aromatic compounds named after the homonymous group -SH present in a molecule. Characterized by very low perception thresholds, they contribute to the aroma of many wines. Although some thiols, such as hydrogen sulfide, ethanethiol and methanethiol, are associated with unpleasant odors, some give pleasant and distinctive aromas to wines obtained from grapes rich in these compounds.

THIOLIC COMPOUND	AROMATIC DESCRIPTOR	PERCEPTION THRESHOLD (ng/L)
4-Mercapto-4-methyl-2-pentanone (4MMP)	Boxwood, Scotch broom, blackcurrant, tomato leaf, cat pee	0.8
3-mercapto-hexanol-acetate (3MHA)	Passion fruit, grapefruit, boxwood, gooseberry, guava	4
3-Mercaptohexanol (3MH)	Grapefruit, passion fruit, gooseberry	60
Benzyl methanethiol (BMT)	Gunpowder, flint	0.3
2-Furfurylthiol (FFT)	Roasted coffee	0.4
2-Methyl-3-furanthiol (2MFT)	Smoked meat	1

Thiolic compounds that contribute positively to the aromatic quality of wine.

THIOLIC VARIETIES

Sauvignon blanc is certainly the star of the thiolic varieties. As research progresses, it has been found that the thiols, especially 4MMP and 3MH, are present in many grape varieties, both white and red.

WHITE VARIETIES	RED VARIETIES
Sauvignon blanc, Cataratto, Chardonnay, Chenin blanc, Colombard, Cortese, Gewurztraminer, Grechetto, Grillo, Gros Manseng, Maccabeo, Moscato, Muscadet, Petit Arvine, Petit Manseng, Pinot bianco, Pinot grigio, Riesling renano, Scheurebe, Semillon, Sylvaner, Tokay, Verdejo	Cabernet Franc, Cabernet Sauvignon, Grenache, Merlot, Pinot noir, Sangiovese

ENARTISFERM YEAST

for the fermentation of thiolic varieties

ENARTISFERM Q4: GRASSY PROFILE

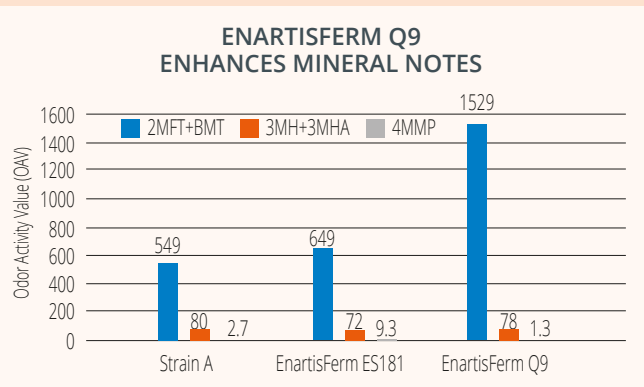
EnartisFerm Q4 is a strain of *Saccharomyces cerevisiae* that has the unusual characteristic of being homozygous for the complete version of the IRC7 gene, a gene that encodes the synthesis of particular β -lyases, active in hydrolyzing cysteine conjugates of 4MMP. This attribute gives yeast the ability to reveal green aromas associated with these specific thiols such as boxwood, tomato leaf, Scotch broom and, at high concentrations, cat pee. Among varietal thiols, 4MMP is certainly the one whose content in grapes is conditioned by the climatic and growing conditions of the vineyard. Where these conditions have grapes with a good 4MMP content, the use of EnartisFerm Q4 produces wines characterized by a pronounced grassy aroma, much sought after by Sauvignon blanc admirers.

Compound	Strain A	Strain B	ENARTISFERM Q4
3MH (OAV*)	62	67	123
3MHA (OAV)	193	137	211
4MMP (OAV)	17	229	380

*Odor Activity Value (OAV) represents a compound's contribution to the aroma of a given food. The OAV is calculated by dividing the value of the concentration of the compound in the food by the threshold of perception of the compound itself.

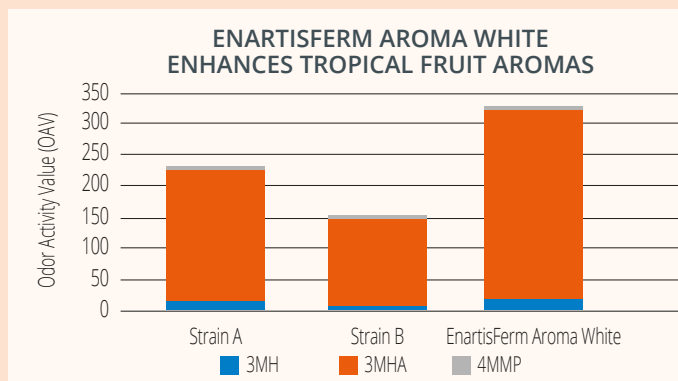
ENARTISFERM Q9: MINERAL PROFILE

When compared to other yeasts, EnartisFerm Q9 has proven to be the most revealing of the thiolic compounds (2MFT, BMT, FFT) associated with smoky notes, typical of Sauvignon blanc from cold regions. The mineral notes become noticeable over time when other aromas that are dominant in the early stages immediately after alcoholic fermentation decrease in concentration. A nutrition protocol for EnartisFerm Q9 favors the use of inorganic nitrogen to enhance the expression of flint, gunpowder and smoked aromas.



ENARTISFERM AROMA WHITE: TROPICAL PROFILE

EnartisFerm Aroma White is the strain of choice when the goal is to enhance tropical fruit notes. Its ability to release 3MH and produce its acetate can be amplified by combining the use of a yeast derivative rich in sulfur containing amino acids such as EnartisPro Blanco at yeast inoculation.



ENARTISFERM ES181: ALL-AROUND THIOLS

When the volumes involved do not reach the desired degree of complexity for working with different yeasts, EnartisFerm ES181 reveals both grassy aromas as well as those of tropical fruit and citrus. Heterozygous for the IRC7 gene and a good ester producer, EnartisFerm ES181 produces significant levels of the three characteristic thiols of Sauvignon blanc: 4MMP, 3MH and 3MHA.

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