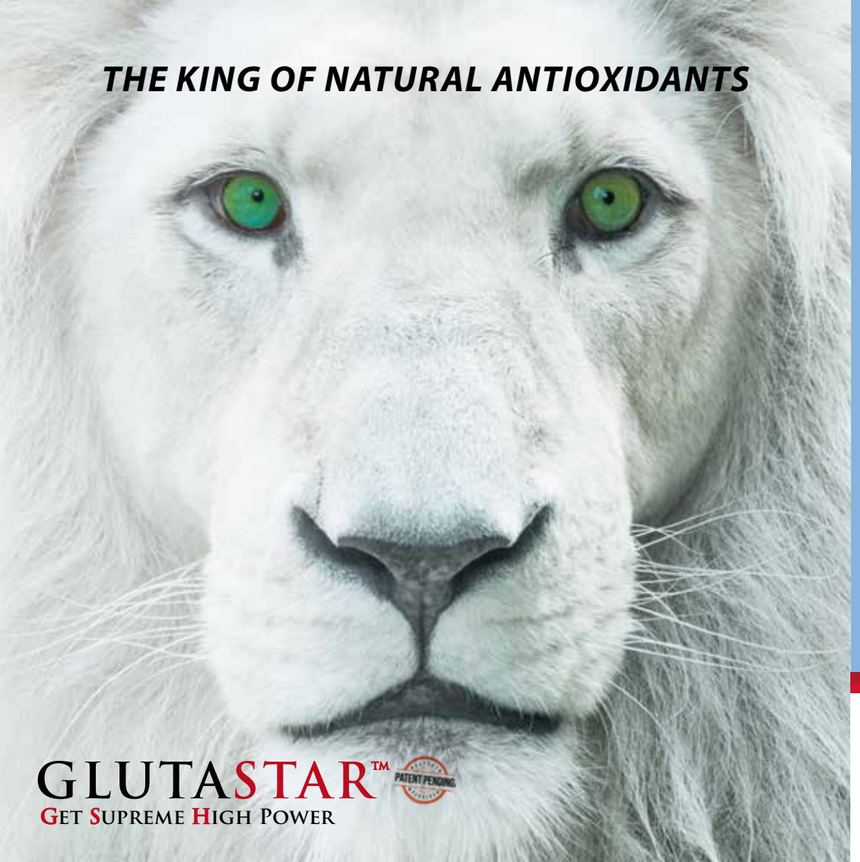

Création YAPAlk - Crédits Photos : iStock

WINE YEASTS | WINE BACTERIA | NUTRIENTS /PROTECTORS | SPECIFIC INACTIVATED YEASTS | ENZYMES | CHITOSAN | VINEYARD SOLUTIONS

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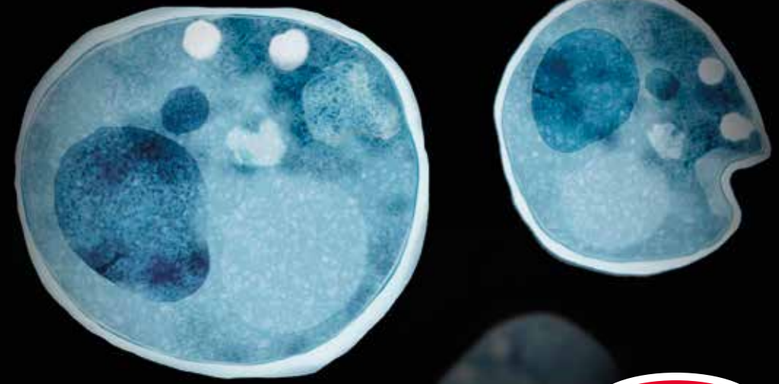
Visionary biological solutions Being original is key to your success. At Lallemand Oenology, we apply our passion for innovation, maximize our skill in production and share our expertise, to select and develop natural microbiological solutions. Dedicated to the individuality of your wine, we support your originality, we cultivate our own. ***www.lallemandwine.com***

INACTIVATED YEAST WITH GUARANTEED GLUTATHIONE LEVELS. WHAT'S THAT ALL ABOUT?



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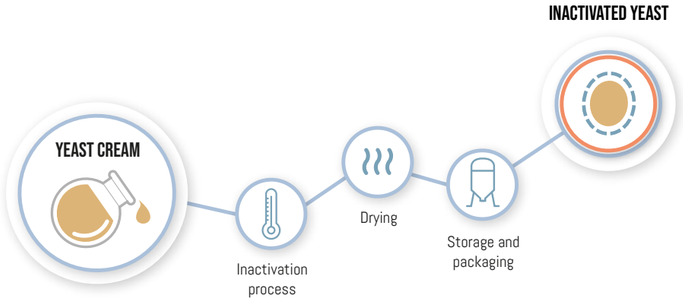
INACTIVATED YEAST WITH GUARANTEED GLUTATHIONE LEVELS - PRODUCTION PROCESS

Since 2003, Lallemand Oenology has designed and optimized its own SIY (selected inactivated yeast) production process, using a selected pure culture of specific *Saccharomyces cerevisiae* yeast and submitting it to specific culture conditions (temperature, medium composition: pH, amino-acids, sugar,…) with the aim to **optimize the glutathione biosynthesis** and accumulation into the intracellular medium.

The production process ends up with a **biomass of yeast rich in reduced glutathione,** that must comply with the new OIV specifications (International Organisation of vine and wine). When the yeast has reached its optimal development, it undergoes a heat and/or pH treatment to be inactivated, then dried, stored and packaged.



OIV SPECIFICATIONS AND LABELLING RULES

Since 2017, the OIV has officially authorized the use of **inactivated yeast with guaranteed glutathione levels*.**
Recently, the OIV defined and adopted the monography (i.e. the specificities of the product) with product specifications and precise labelling rules. This mainly targets the composition of the final product.
Products labelled **"inactivated yeast with guaranteed glutathione levels"** must comply with the following specifications:

SPECIFICATIONS REQUIRED	OBJECTIVE
a minimal content in reduced glutathione (GSH) of 10 mg/g	to contain sufficient GSH concentration in the product
a maximal cysteine content of 3 mg/g	to limit the production of undesirable sulphur compounds
a maximal gamma-glutamyl-cysteine (gGC) content of 10 mg/g	to limit the intermediary precursor and leave more space to the reduced glutathione which is the interesting compound

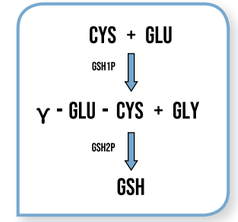
Also, the inactivated yeast with guaranteed glutathione levels must comply with other specifications:

- the ratio gGC/GSH has to be higher than 20% to guarantee that the GSH is **from a yeast-origin** and **not added in the final product as it is strictly forbidden.**
- the ratio between reduced glutathione (GSH) and oxidized glutathione (GSSG) should be higher than 3.

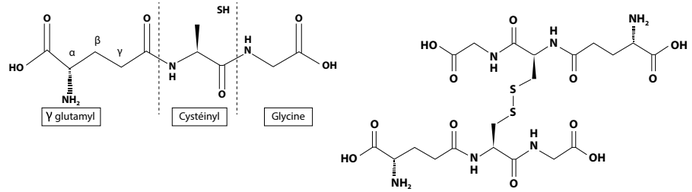
* www.oiv.int/public/medias/5366/oiv-oeno-533-2017-en.pdf

WHAT ABOUT GLUTATHIONE?

Glutathione (L-g-glutamyl-L-cysteinyl-glycine) is a tripeptide which contains three constitutive amino acids: glutamate, cysteine and glycine. It comes from the natural metabolism of *Saccharomyces cerevisiae* or non-*Saccharomyces* yeasts.



In must, wine or even yeast, glutathione can be found under its reduced (GSH) or oxidized form (GSSG).



Glutathione is important in wine **under its reduced form - GSH** because it has the ability to scavenge orthoquinones, main protagonists of color browning and aroma loss due to oxidation mechanisms.