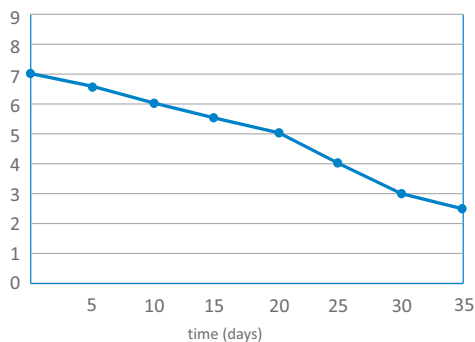


# Enovin lyso

Enzyme precision

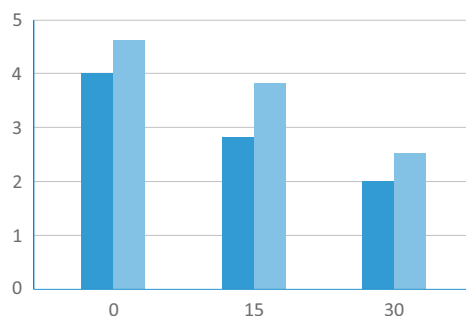
## Lysozyme for the control of lactic acid bacteria

population (log CFU/ml)



Evolution of bacterial population after MLF with lysozyme application. Dose: 25g/hl. Tempranillo varietal, CI: 0.8, pH 3.8, Total SO<sub>2</sub>: 6 ppm.

population (log CFU/ml)



Effectiveness of Enovin Lyso at doses of 0, 15 and 30 g/hl respectively in two red wines with a high initial population of lactic bacteria.

Vino 1: Tempranillo, pH 3,7, SO<sub>2</sub> molecular 0,23.

Vino 2: Tempranillo, pH 3,9, SO<sub>2</sub> molecular 0,12.

### Characteristics

Lysozyme is an enzyme that is widely distributed in living beings as an antibacterial defence mechanism. Its action consists in **rupturing the cell walls of Gram-positive bacteria, including lactic acid bacteria (Oenococcus, Pediococcus and Lactobacillus).**

Lysozyme is **not active against** Gram-negative bacteria like **acetic acid bacteria** because the structure of the cell wall of these bacteria is different and more resistant. **It has no activity on yeasts** and thus does not influence alcoholic fermentation.

The **effectiveness** of lysozyme not only **depends on the type of bacteria**, but also on the **number of bacterial cells** present in the medium.

In contrast with SO<sub>2</sub>, **lysozyme is more effective at high pH**, which is most favourable for lactic acid bacteria growth.

### Application

- **Inhibition of malolactic fermentation** in the preparation of white wines and young red wines, in order to maintain acidity.
- **Delay of MLF** after alcoholic fermentation in the preparation of red wines, which makes it possible to work with micro-oxygenation.
- **Microbiological stability** of the bacterial population in red wines **after malolactic fermentation**, reducing the dose of SO<sub>2</sub> used during wine preservation
- **Treatment of stuck fermentation** to prevent the consumption of must sugars by lactic acid bacteria (lactic spoilage) and reduce the risk of increased volatile acidity.

### Enzymatic activity

Enovin Lyso preparation has 100% lysozyme enzymatic activity.

Activity FIP[UI/mg]

Enovin Lyso

> 35000

FIP Unit: measure of enzymatic activity according to the test method of the International Pharmaceutical Federation (FIP).

## Dosing

Stabilisation after MLF	> 15 g/hl
Delayed start of MLF	> 25 g/hl
Blocked MLF	50 g/hl

*We recommend that the minimum effective dose be adjusted by running a panel of tests previously (See Agrovin Lisozima Work Sheet: Previous assays).*

## Instructions for use

- 1.- Weigh out the amount of lysozyme to be used.
- 2.- Add this amount to about five-fold its weight in lukewarm water (30°C = 86°F).
- 3.- Stir gently for 1 min. Avoid raising foam.
- 4.- Wait 45 minutes and stir again.
- 5.- Repeat steps 4 and 5 until the solution is completely dissolved and a colourless, completely transparent liquid is obtained.
- 6.- Add to the volume to be treated, ensuring homogeneous mixing.
- 7.- Stir gently a few hours after adding.

## Precautions.

- **Do not use with bentonite**, because it absorbs and deactivates the enzyme. If the wine contains bentonite, wait until after clarification and racking before adding lysozyme. If the wine has already been treated with lysozyme, wait at least one week to allow the enzyme to act before adding bentonite.
- **In the treatment of white wines, application of lysozyme increases the protein instability** detected in routine tests (bentonite or heat test).

*Please note: Lysozyme cannot replace  $SO_2$  use because it does not have antioxidant effect and, as an antimicrobial, is ineffective against yeasts or acetic acid bacteria. However, it reduces the amount of  $SO_2$  necesario para conseguir la estabilidad microbiana del vino.*

## Physical appearance

Fine, white, odourless powder.

## Presentation

0,5 kg package.

## Physico-chemical and microbiological properties

Total nitrogen [%]	16.8-17.8
Moisture content [%]	< 6
Sulfated ash [%]	< 1.5
Heavy metals [mg/kg]	< 10
As [mg/kg]	< 1
Pb [mg/kg]	< 2
Hg [mg/kg]	< 1
Total microorganism count [CFU/g]	< 10 <sup>3</sup>
Total coliforms [CFU/g]	< 10
<i>E. coli</i> [CFU/g]	Absent
<i>Salmonella</i> [CFU/25g]	Absent
<i>Staphylococcus aureus</i> [CFU/g]	Absent
Moulds [CFU/g]	< 10 <sup>2</sup>

## Production



**Enovin Lyso** is obtained from chicken egg albumin and is used as lysozyme hydrochloride.

## Storage

Store in the original packaging in a cool, dry, odour-free place.

Once open, maintain at a temperature of 4 °C.

Prolonged exposure to temperatures above 35 °C and/or moisture will reduce its effectiveness.

REGISTRATION: R.G.S.A: 31.00391/CR

Product compliant with International Oenological Codex and EC Regulation No. 606/2009.