

LYSOCH™

MICROBIAL LYSOZYME



4

Key benefits

- Lysis of Gram-positive and Gram-negative bacteria
- Allergen-free and Non-GMO
- Cost-efficiency
- Shelf-life extension
- Green label

THE POWERFUL BROAD-SPECTRUM ANTIMICROBIAL ENZYME

The growing trend of consumers look for natural simple processed foods containing free from such as allergen and GMO. However, these types of foods are susceptible to bacterial contamination. Lysozyme has been accepted as a natural antimicrobial enzyme and it is acknowledged as green label. However, Lysozyme from hen's egg used as an anti-microbial enzyme is limited to its allergic reactions and inactivation of Gram-negative bacteria in processed foods.

Lysoch™ G4 microbial lysozyme and Lysoch™ L4 liquid lysozyme are produced by bacterium *Streptomyces* sp., and are beyond these limitations used to lyse the cell of Gram-positive and Gram-negative bacteria in low-temperature processed foods.

Brands



LYSOCH™ G4
MICROBIAL LYSOZYME



LYSOCH™ L4
LIQUID LYSOZYME



Table 1 Applications

Food categories		Applications	Typical cases	Lysoch™ G4	Lysoch™ L4	Benefits (Organisms controlled)
Beverages	Alcohol beverages	Beer	Grape wine	10 mg/L	0.5 ml/L	Lactic acid bacteria (<i>Pediococcus</i> , <i>Lactobacillus</i> and <i>Oenococcus</i>)
Dairy	Cheese	Edam, Gouda, Emmental, Swiss, Provolone, Romano, Montasio, Danbo, Asiago, Conte, Alpine types, Manchego		5-10 mg/L milk	0.25-0.5 ml/L	<i>Clostridium tyrobutyricum</i> , <i>E. Coli</i>

Case 1: Red wine

In red wines, the main Gram-positive bacteria are lactic acid bacteria (*Pediococcus*, *Lactobacillus* and *Oenococcus*). *Lactobacillus* or *Pediococcus* carry out MLF because they produce undesirable compounds such as volatile acidity (VA). Problems can even arise when red wines contain *Oenococcus* if MLF finishes before alcoholic fermentation. At the end of MLF, all lactic acid bacteria may begin to consume sugars and produce high levels of VA, ruining the wine.

Figure 1 shows when replacing sulphur dioxide, 10 mg/L Lysoch™ G4 has a similar control effect of Lactic acid bacteria as 100 mg/L egg-white lysozyme in red wine.

Lactic acid bacteria

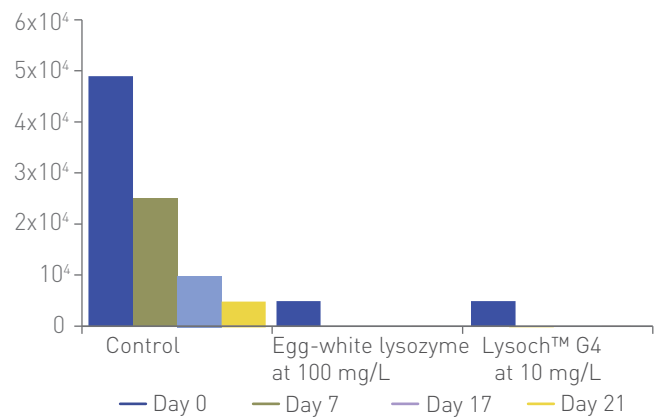


Figure 1

Case 2: Gouda cheese

Butyric fermentation or "late blowing" in Gouda cheese is a ripening defect caused by *Clostridium tyrobutyricum*. Its growth leads to the formation of H₂ and CO₂ gases, cracks and slits in the cheese, and an abnormal aroma and cheese flavour.

Figure 2 shows that the effect of Lysoch™ G4 at 5 mg/L has a stronger inhibition of *Clostridium tyrobutyricum* than 40 mg/L egg-white lysozyme in Gouda cheese. Figure 3 shows that addition of 0.5g/L Lysoch™ G4 in Gouda cheese effectively inhibits butyric acid bacteria and prevents the pH decrease.

Clostridium tyrobutyricum

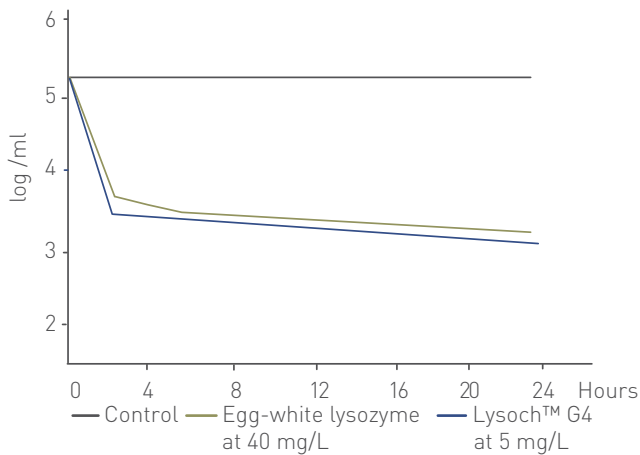


Figure 2

pH

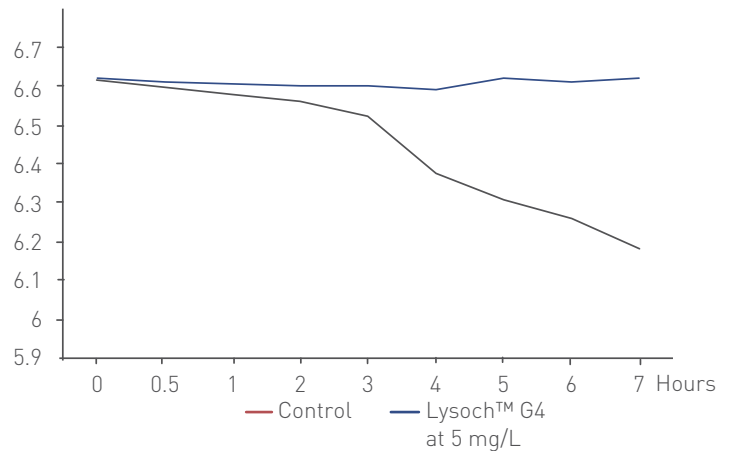


Figure 3