



LALLEMAND, Experts in bacteria production

Lallemand is one of the leading companies in the world producing bacteria for a wide range of markets, including the pharmaceutical industry, human health, animal nutrition, agriculture, bakeries, the cheese-making industry and oenology. Specialty bacteria production requires very demanding processes in order to obtain high quality products.

Five plants in the Lallemand group are dedicated exclusively to the production of bacteria, each utilizing specific techniques according to:

- The type of bacteria produced: *Lactobacillus*, *Pediococcus*, *Bifidobacterium*, *Oenococcus*, *Propionibacterium* or *Bacillus*, etc.
- The different species in the same genus: *Lactobacillus buchneri*, *Lactobacillus plantarum*, *Lactobacillus acidophilus*, and so on.
- The diversity of strains in the same species, *Oenococcus oeni* for example.
- Their formulation: lyophilized powders, capsules, tablets, etc.

Lallemand, a production plant dedicated to the production of wine bacteria in France

We have the capacity to produce more than 20 different malolactic bacteria. The bacteria are produced according to the different processes adapted to a wide variety of oenological conditions, such as the MBR®, 1-STEP® and STANDARD. To produce high quality wine bacteria, we have combined the production of all our wine bacteria at a single industrial site.

The plant at Saint-Simon (near Aurillac in south-central France) is at the cutting edge of technology and has earned numerous quality certifications, such as those required for the pharmaceutical industry. The plant is ideal for the production of lyophilized bacteria.



Fermentation workshop
Industrial production site in Saint-Simon, France

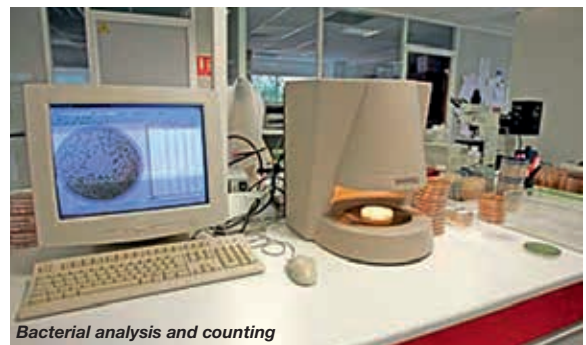
Lallemand, experts in the production of wine bacteria

Great expertise is required to obtain selected bacteria adapted to the particular conditions of wine. For example, the production process for the *Oenococcus oeni* type of wine bacteria is long (more than six weeks) and requires meticulous attention at each step of production, but it also varies from one strain to another. Thus, we must develop a specific production process for each type of bacteria.

Supported by teams of technicians and process engineers specialized in bacteria, Lallemand has developed high-performance expertise in the industry. This savoir-faire is enlightened by the scientific knowledge Lallemand has cultivated in the field of winemaking.



Fine tuning the pilot fermenter process



Bacterial analysis and counting



LALLEMAND, Experts in bacteria production

Lallemand, a global approach to quality

At Lallemand, we owe our success to our ability to offer the market wine bacteria that are reliable. This savoir-faire requires the combination of rigorous scientific, microbiological, oenological and industrial expertise.



Each type of bacteria is the result of a selection program that often involves partnerships with technical institutes validating the oenological interest of the bacteria. Institutes such as the Institut Français de la Vigne et du Vin (IFV), the Comité Interprofessionnel du vin de Champagne (CIVC), and the Edmund Mach Foundation, formerly the Istituto Agrario di San Michele all'Adige (IASMA) in Italy. Once validated,

the feasibility of industrial production is studied and, if the results are satisfactory, a specific and optimized production protocol is developed. Only through carefully attention, can we deliver an effective lyophilized product.

Beyond complying with the standards defined by regulations on bacteria populations and microbiological purity, Lallemand has developed their own criteria for quality and malolactic activity based on years of experience. These criteria allow us to guarantee the availability of products with a long, stable shelf life that are robust and vigorous as soon as they are inoculated into musts or wines around the world.



Laboratory process: first step in the production feasibility studies.

Lallemand, a major player in the oenological bacteria market

The development of three different manufacturing processes (MBR®, 1-STEP® and STANDARD) and the production of more than 20 malolactic bacteria strains with specific properties make Lallemand an very important contributor to the world of oenological bacteria.

