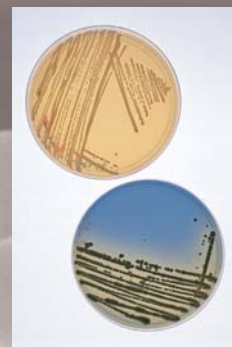
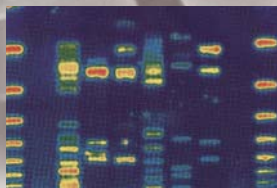


RESEARCH AND DEVELOPMENT



PHILOSOPHY

"New thoughts and new ideas create new deeds. When they are for the betterment of mankind may they succeed... Cooperation spells success."

This 1938 quote from Fred A. Lallemand, founder of the company, clearly reflects the spirit of innovation and cooperation still prevailing in our company. Today, this very same determination to innovate and to cooperate in order to develop new products and processes still guides most of Lallemand's activities.

Research and Development is a major element in successfully identifying and satisfying the needs of the market segments in which Lallemand strives to play an active and leading role.

GOALS

Lallemand's activity in research aims at:

1. Continuously improving the quality of our products, in order to respond adequately to the demands of our existing and potential clients.
2. Constantly improving the productivity and output of our processes.
3. Developing new products, anticipating or responding to the needs of the market.
4. Monitoring new international developments in the sectors of biotechnology, microbiology and engineering, closely linked to our mission as a yeast and bacteria producer.
5. Providing our staff with efficient ongoing education, hence promoting successful transfers of technology.

RESEARCH AND DEVELOPMENT INFRASTRUCTURE

Lallemand's research department includes 2 research laboratories working on process improvement, and 4 application laboratories, supporting our four targeted markets: bakery, fermented beverages, animal nutrition and human nutrition.

The yeast process research laboratory is located at the Biotechnology Research Institute in Montréal. There, we work on fermentation and strain improvement processes and have access to the most sophisticated technologies, equipments and pilot installations. Thanks to those, we work on the genome of yeast as well as on pilot projects that allow us to test our strains' behaviour under industrial conditions.

The bacteria research laboratory is located in Toulouse, France. There, among other directions, we concentrate our research on the influence of the spreading conditions on the technological performances of our strains. We use our own pilot equipments for fermentation, freeze-drying and coating processes. The different coating technologies we master there allow us to constantly improve the resistance of our products to several physical and chemical stresses, therefore responding more adequately to our clients' needs.

The bakery applications laboratory is located in Montréal. We have developed an expertise in yeasts (be it liquid, fresh or dry) and bacteria as well as in baking ingredients, including bread improvers, dough conditioners, bromate substitutes and a whole range of new applications for different segments of the bakery market.



www.lallemand.com

Head office
LALLEMAND Inc.
151 Skyway Avenue
Rexdale (Ontario) M9W 4Z5
Canada

Administrative offices
LALLEMAND INC.
1620, rue Préfontaine
Montréal (Québec) H1W 2N8
Canada
Phone: (1) 514-522-2133
Fax: (1) 514-522-2884

The human nutrition applications laboratory is located at the Rosell Institute and at the BRI in Montréal. The Rosell Institute is a pioneer since 1932 in the production of lactic bacteria, or probiotics. In this laboratory we have mastered the art of developing original formulations as well as original intake forms ranging from gel caps to chewable tablets, enhancing these preparations with new properties such as room temperature stability and enteric resistance. In this same fashion, we strive to improve the performance of our minerals and vitamins enriched yeasts.

The fermented beverages applications laboratory is located in Toulouse. At this facility, we work on characterizing our yeast and bacteria strains, as well as a range of by-products such as mannoproteins, nutrients and enzymes. We have also developed a whole range of direct sowing malolactic bacteria, which make the wine growers' work easier. The collaboration we maintain with the *Institut des Produits de la Vigne* of the Montpellier INRA (the Vineyard Produce Institute) allowed us to successfully determine the role played by the yeast killer factor, to explain our strains' need for nitrogen and oxygen, as well as the influence of nutrients and of the composition of the rehydration environment on the reduction of our yeasts and bacteria latency period.

The animal nutrition applications laboratory is also located in Toulouse. There, with the collaboration of several other institutes, we have selected unique yeast and bacteria strains intended to improve the zootechnical performance of ruminants and non-ruminants. The coating technique we use enhances the strains' resistance to the high temperatures and pressure encountered during the manufacturing of granules. We have also selected a range of lactic bacteria strains to ensure the ensilages' aerobic stability (*Pedicoques*, *propionibacteria*, *Lactobacillus buchneri*). All these strains are registered with the European Union and provide the breeders with biologic alternatives to chemicals, helping to minimize the resistance to antibiotics and to improve the quality of their products. We also work in close collaboration with the INRA of Theix, where, since more than a decade, our scientists work towards better understanding the benefits brought by our strains to the good functioning of the rumen.

COLLABORATIONS AND ASSOCIATIONS IN RESEARCH AND DEVELOPMENT

From the beginning, Lallemand has always been aware of the necessity to collaborate with universities and research institutes to stay up to date with the latest progress in technology.

In Canada, Lallemand maintains an active collaboration with Laval University, McGill University, the *Centre de Recherche sur le Développement des Aliments (CRDA)* (Food Development Research Center) of Agriculture Canada, the Biotechnology Research Institute (BRI) of the National Research Council, the *Institut de Biotechnologie Vétérinaire de Saint-Hyacinthe* (Veterinarian Biotechnology Institute of Saint-Hyacinthe) and with the Cool Climate Oenology and Viticulture Institute at Brock University in Ontario.

These collaborations have been extended worldwide and include activities representing each one of our four main markets. In baking, for example, Lallemand is active within the *Versuchsanstalt der Hefeindustrie* at the Technical University of Berlin, where our employees study and improve their scientific and technical knowledge of bakery yeast. We also work with the university of Nantes (France) on bacteria bakery starters used in the preparation of bread and sourdough.

We also have cooperation agreements throughout the world in the field of fermented beverages. Some of the organizations working with us are: the University of California at Davis and at Fresno, and Cornell University in the United States; the INRA in Montpellier, the *Institut de Génie Chimique* (Chemical Engineering Institute) in Toulouse, the *Institut d'Oenologie* in Bordeaux and many other professional institutions in France; the *Geisenheim Institut* (Germany), the Australian Wine Research Institute, Stellenbosch University (South Africa), INTA (Argentina), etc.

We validate our animal nutrition yeasts and bacteria strains through large scale zootechnical trials, with the cooperation of institutions such as the INRA in Theix, the ESAP in Toulouse, the IRTA in Spain, the School of Veterinarian Medicine in Milano, ONAB in Algeria, the Agriculture Canada station in Lennoxville, etc.

Finally, we also maintain collaborations in the field of human nutrition by participating in pre-clinical and clinical trials performed on our probiotic yeasts and bacteria and on our mineral enriched yeasts at the Maisonneuve-Rosemont Hospital in Montreal, Acadia University in Nova-Scotia, the Toronto Sick Children Hospital, Laval University in Quebec City, the TNO in Holland.