

Research on Butyric Spores and Heterofermentative Bacteria Present in Milk and with Direct Impact on Cheesemaking Technology

Project Details:

- Acronym: HETEGAZ
- Start date: 01-01-2026
- End date: 31-12-2026
- Funding: Basque Government 2026

Description:

This project aims to conduct an in-depth analysis of the microbiological quality of cow's milk in the Basque Country and to identify the origin of the most common defects observed in cheeses—swelling, cracks, irregular eyes, sour odours or sharp/pungent flavours—by characterizing the presence and behaviour of butyric spores and heterofermentative bacteria such as *Leuconostoc* and *Lactobacillus parabuchneri*. To achieve this, traditional microbiological techniques are combined with specific quantification methods using PCR and qPCR, as well as advanced tools such as 16S metagenomics, enabling a comprehensive understanding of the milk microbiota and its evolution. In parallel, pilot production trials of cow's milk cheeses are carried out to evaluate the influence of native microorganisms on coagulation, maturation, and cheese stability, and to determine the relationship between physico-chemical defects and the accumulation of biogenic amines (histamine, tyramine...). The integrated information obtained makes it possible to define predictive risk models and practical prevention strategies that help the dairy sector produce safer, higher-quality, and more consistent cheeses.

Participants:

- Leartiker S.Coop

Activities carried out

1. Analysis of milk microbiology using traditional and standardized methods (enterobacteria, coliforms, butyric spores, *Leuconostoc*, yeasts, and major pathogens).



2. Development of molecular analyses using PCR, qPCR, and 16S metagenomics to accurately identify the presence and dynamics of key microorganisms.
3. Pilot production of cow's milk cheeses to study maturation behaviour and the appearance of defects in relation to the initial microbiota.
4. Quantification of biogenic amines (histamine, tyramine, etc.) to identify the origin of safety risks and organoleptic defects.
5. Integrated interpretation of metagenomic, microbiological, and physico-chemical data to propose risk models, critical control points, and improvement guidelines for the sector.

