

Pizza Cheese: Yield increase versus shelf life, what solutions can be offered?

Dalton Biotecnologie offers customized solutions for the fermentation process

Dalton Biotecnologie has been producing starter cultures since 1974, offering customized solutions for the optimization and management of fermentation processes. In order to provide the most appropriate biological solution, defining the best formulation for each specific production process is crucial. Dalton tailored formulations result from the evaluation of different elements, such as product characteristics, milk parameters, technological production parameters and phage situation.

Working closely with its customers, the Italian company finds the right combination of the various aspects that contribute to the success of the final product. Referring to pasta filata production, during on-site technical assistance producers often ask questions about the increase of the moisture level of the final product without compromising stability, the maintenance of product characteristics throughout the shelf-life and its extension without damaging the yield. In most cases, the common challenge is to find the right compromise between product stability and yield optimization. Over these years, Dalton selected and developed production methods of *Streptococcus thermophilus* strains, improving fermentation management to increase the stability of the protein structure of pasta filata and reducing the proteolysis, which is the main cause of the major alterations of the product during shelf-life. Proteolytic activity in dairy products is one of the most important, complex and qualifying phenomena in the cheese transformation process, playing a crucial role in the development of cheese characteristics.

Proteolysis occurs with a different intensity according to various factors; among these, the main one is the enzyme pool. Its composition is mainly defined by enzymes deriving from bacterial activities. This composition, only partially regulated by the parameters of the production process, is the result of the chosen formulations and the applied phage management. The optimization of product characteristics and their stability during shelf-life is therefore strongly related to starter cultures composition and to the biological process management. Dalton developed a new starter cultures "SP line", available in tailored formulations, with the following characteristics:

- their activity is very sensitive to technological factors (temperature, coagulation, syneresis, etc.), therefore the performance is easier to manage on the basis of the chosen formulation and the processing parameters;
- minor nutritional needs, therefore they are less influenced by the variable milk composition and that is why they guarantee the conformity of their acidifying performances, mainly on the basis of the chosen formulation;
- good acidifying activity in a range of pH 6.80–5.30, but they are strongly inhibited in



Dalton has developed a new starter cultures "SP line", available in tailored formulations, for pizza cheeses. (photograph: Dalton Biotecnologie)

correspondence of the pH values at the end of the process, which can nonetheless be defined on the basis of the chosen formulation; therefore, they guarantee good processing performance as well as high stability of the mature curds and, consequently, of the final products.

Starter SP does not carry out a proteolytic activity, whether during or after the process, therefore it guarantees the stability of the curd and of the product texture and offers higher coherence and extended shelf-life. ▲

SP starter practical advantages

Manageability of the process

Higher independence from milk composition and less dependence from voluntary technological parameters guarantee the compliance with acidification/ripening times which are expected in the formulation phase of the SP cultures. The SP cultures have the property of inhibiting themselves rapidly to a pH lower than 5.30 and of stabilizing at pH values which are expected in the formulation phase.

Manageability of the curds

The texture of the pasta filata keeps elasticity and good structure, even if stretched after some time, thanks to the absence of post-fermentation and proteolysis.

The acidimetric stability of the ripened curd allows to approach optimum stretching pH values, by optimizing the structural and organoleptical features of the final product and of the production yield.

The stability of the ripened curd and the optimum level of maturation allows to use a lower stretching temperature, with minor degreasing effect and a possible increase of the washing index of the curd.

In case of a possible operative stop caused by technical loss, the ripened curds may stay several hours without changing neither their features nor the quality of the corresponding final product.

Pizza-cheese

The stability of the ripened curd, yet more after stretching, guarantees higher preser-

ving of the final product which remains very consistent with the initial features.

The higher guarantee for preserving the final product allows a possible increase of the moisture in the final product without modifying the functional and structural features. The texture stability of the curd and of the pasta filata avoids the defect of adherence in the cheese during the milling or inside the packing.

The texture stability of pasta filata eliminates the tendency of the milled to release water inside the packing, also with higher moisture values. The lack of proteolytic activity with the SP cultures allows to manage independently the acidification needs from the functional needs and optimizes the results.

Fresh mozzarella

Because of the absence of proteolytic activity the stretched pasta filata has more elasticity, more lucidity, more stretching ability and a pH compatibility in a larger pH value range.

The stability of the ripened curd, yet more after stretching, guarantees higher preserving of the final product which remains very consistent with the initial features.

The higher guarantee for preserving the final product allows a possible increase of the moisture, that is an improvement of the yield. The texture stability of mozzarella eliminates/reduces the phenomenon of weight loss and volume loss and maintains the milk liquid inside and the stability of the covering liquid.