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Production of an antimicrobial edible casein-based material

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Caseins constitute 80% of milk proteins and have great potential for producing protein-based edible films. Several problems need to be solved before casein films can be widely commercialized. For example, the high moisture sensitivity (easy adsorption and release of water molecules which act as plasticizer and affect mechanical properties) has to be controlled and the production costs due to production method have to be reduced. The goal of the present study is to obtain edible, and antimicrobial casein-based materials. The first targeted application is the development of edible labels to put on cheeses. These labels should keep a good readability during cheese ripening and commercialization, in order to guarantee the traceability of these cheeses but without sensory changes for cheeses. The current process used to produce cheese labels is a batch process implying high pressures and high temperatures during several hours, which is not compatible with thermolabile antimicrobial compounds addition. With extrusion, which is a continuous process, temperature and residence time can be adapted to preserve the activity of antimicrobial compounds added in the formulation. Casting of film forming suspensions on flat surfaces and their subsequent drying to prepare films is adequate for laboratory use and, perhaps, is sometimes also suitable for batch production. However, more efficient techniques are needed for commercial films production. Association of dairy food knowledge and polymers production processes allows a new continuous process at relatively low temperature (less than 100°C) which allows production of active films made of rennet caseins and organic acids or their salts.

Biography

Elodie Chevalier is a 2nd year PhD student working at the University of Saint Etienne in the laboratory called IMP (Polymer Materials Engineering) with Frédéric Prochazka and also working in the laboratory called BioDyMIA (Bioengineering and Microbial Dynamics at Food Interfaces) with Nadia Oulahal. Prior to beginning of PhD program, she completed an Engineering degree in Biology as well as a Master's degree in Biotechnology at the University of Technology of Compiègne (France).

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