

Effect of heat treatments on the functional properties of traditional cheeses: Blue veined cheeses

ABSTRACT

Sales of PDO cheeses undergo a decline. The use of these cheeses in the form of ingredient represents an interesting alternative to the tasting and would allow to maintain a sustainable business activity to the producers of these cheeses.

The objective of this work is to investigate the potentialities of four categories of Blue cheese PDO of the Massif Central as an ingredient to meet their properties during heating such as "melting, stretchability, browning". The functional properties desired for this type of cheese have been investigated by physico-chemical methods and instrumental classics and also by spectral method and sensory evaluations to enrich the observations of the macro and microstructure of the cheese and the consumer perception.

First, the physicochemical, rheological, sensory characteristics and certain properties during heating have been reported for four categories of Blue cheese. These initial results allowed us to characterize the cheese studied according to their characteristics essentially which were related to the organization matrix constitutes such as proteins, fats, minerals. The sensory analysis allowed to describe exactly certain properties which are not revealed by the other analyses.

Blue-veined cheeses have a great heterogeneity due to the presence of "veins" of mold. The second part is a study on the ability of the SFS method to study the micro structure and to predict the diversity of composition of these cheeses. Despite the high heterogeneity of cheeses, SFS allows an identifiable 'fingerprint' of cheese and predicts some but not the totality of the physicochemical parameters.

The evolution of the macro-and microstructure of these cheeses during heating and cooling was then studied by SFS and dynamic shear test. These methods describe well the melting temperature of the fat and the cheese matrix. They are correlated between them and demonstrate a relationship between the molecular structure and the rheological properties of these cheeses.

A comparative study of the sensory textural properties of cheeses was carried out in the non- and heated forms. The attributes describe different characteristics of texture between the two conditions. This approach allowed to differentiate well the four categories of cheeses and to highlight on certain attributes of quality or defects to be used in cooking application.

In conclusion, these four categories of Blue-veined cheeses have the potential to be used as an ingredient in cooking application. The sensory analysis characterized the perceptions of the consumers in both non- and heated forms and thus helps to specify their features. The rheological and spectral analyses have provided explanations related to this treatment at the level of the macro and microstructure of the cheese matrix

Keywords: Cheese ingredient, Blue-veined cheese, heat treatment, functional properties, dynamic shear test, synchronous fluorescence spectroscopy, sensory analysis, chemometrics.