



IV Iberian Congress on Biotechnology
I Ibero-American Meeting on Biotechnology

BIOTEC'98

BOOK OF ABSTRACTS

Edited by

MANUEL MOTA and EUGÉNIO C. FERREIRA

Dominant Microflora of *Picante* Cheese: Independent Role upon Proteolysis and Lipolysis in Model Systems

A. Cristina Freitas, Ana E. Pintado, Manuela E. Pintado and F. Xavier Malcata*

Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Rua Dr. António Bernardino de Almeida, P-4200 Porto, Portugal

Key Words: Picante cheese, proteolysis, lipolysis, microflora

Four species of bacteria (two species of enterococci, *Enterococcus faecium* and *Enterococcus faecalis*, and two species of lactobacilli, *Lactobacillus plantarum* and *Lactobacillus paracasei*) and three species of yeasts (*Debaryomyces hansenii*, *Yarrowia lipolytica* and *Cryptococcus laurentii*), previously isolated from *Picante* cheese were assayed for biochemical performance in proteolysis and lipolysis. In addition to the difference of the microbiological strains, the milk type (caprine or ovine), the ripening time (0 to 65 days) and the concentration of NaCl (0 to 14%(w/v)) have been deliberately fixed *in vitro* curdled milk (previously prepared from heat-sterilized milk, coagulated with animal rennet and inoculated with each strain) and subject to 12 °C. High proteolytic activity was demonstrated by *Y. lipolytica* and by all the other strains to a lesser extent; *Y. lipolytica* produced ca. 85% of WSN by 65 days of ripening whereas *E. faecium*, *D. hansenii* and *C. laurentii* produced levels of WSN ranging in 40-50%, and *E. faecalis*, *L. plantarum* and *L. paracasei* in 30-40%. In terms of peptidolytic activity, measured by NPN contents and by release of free amino acids, once again *Y. lipolytica* presented the highest activity, followed by *L. plantarum*, *L. paracasei*, *E. faecium* and *E. faecalis*. Milk type, ripening time, and content of NaCl revealed to be statistically significant processing factors in terms of proteolysis; caprine milk, 65 days of ripening and lower contents of NaCl led to the highest values. The lipolytic activity, assessed by the release of butyric acid from tributyrin, was strong for *Y. lipolytica* and *C. laurentii*, whereas release of free fatty acids was observed at different rates for all strains under study. Ripening time proved to be a statistically significant factor for lipolysis, whereas milk type was not; lipolytic activities, measured as fat acidity index, were strongly affected by NaCl content and, as happened with release of free amino acids, the extent of fat hydrolysis was much more affected by the increase of NaCl from 0 to 7% than by its increase from 7% to 14%. Although it is not possible to directly compare results obtained *in vitro* using pure, single cultures with those obtained *in loco* using actual cheese, our results suggest that a mixed-strain starter for *Picante* cheese including *L. plantarum*, *E. faecium* (or *E. faecalis*) and *D. hansenii* (and/or *Y. lipolytica*) would be of potential interest.