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## Behavior of *Listeria monocytogenes* in sheep raw milk cheeses: a study at different stages of production and shelf life.

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### Introduction

Several bacteria are able to contaminate dairy products. Among them, *L. monocytogenes* is included in the safety criteria regulation (EC) No 2073/2005 for dairy products. The DiversiFerm project (formerly Cellule Qualité des Produits Fermiers) funded by Wallonia aims to provide support to artisanal producers, including food safety system implementation. Analytical data generated for several years show that low levels, <100 cfu/g of *L. monocytogenes* contamination are observed in raw milk cheeses (Sanchez *et al*, 2010). The present work aims to follow through aging tests, *L. Monocytogenes* behavior during cheeses ripening and during their shelf-life.

### Material and methods

Dairy products including sheep raw milk, soft, fresh and pressed cheeses were used in this work. A state of contamination level of these products, relative to *L. Monocytogenes* was first assessed. Physical and chemical characteristics were determined and microbiological analyses were performed according to the NF EN ISO 11290-2/A1 (02/2005). Then, soft and pressed cheeses manufactured from sheep raw milk, contaminated by *L. Monocytogenes* were sampled in order to follow this pathogen behavior during the ripening and during their shelf-life.

### Results

No significant increase in *L. Monocytogenes* level was observed during the ripening step, for the cheeses tested. A growth from 4,2 log cfu/g, after 24 days of manufacture to 4,9 log cfu/g (uncertainty of measurements :  $\pm 0,5$  log cfu/g) at the end of the soft cheese ripening was noted.

Moreover, during the cold storage, the strain's growth suppression was observed, following by a stationary phase with its concentration maintained about  $4,4 \pm 0,2$  log cfu/g until the cheese shelf-life end. Similar results were observed with the pressed cheeses.

### Discussion

No significant increase in *L. Monocytogenes* level was observed during the ripening step, for the cheeses tested. *L. Monocytogenes* growth rate was different, in relation to cheeses types and the development step. The cold storage resulted in *L. Monocytogenes* decreasing in cheeses without total disappearance. Moreover, a remarkable growth trend is observed after a break in the cold chain. The levels of initial contamination in cheeses tested are considered as high compared to those of <100 ufc/g and mostly <10 ufc/g encountered in farm dairy products, at all stages of ripening and storage (Schvartzam *et al*, 2011; Sanchez *et al*, 2010).

### References

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