

Study of the growth potential of *Listeria monocytogenes* in cheeses made by Belgian farmers

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Listeria monocytogenes is a bacterium be responsible for health problems. Regarding the hazard, Regulation (EC) N  2073/2005 asks an absence of the bacterium in food suitable for its growth. An alternative criterion allows the producers to demonstrate that the pathogen cannot grow up to 100 cfu/g during shelf-life¹. Cheese has already been responsible for listeriosis outbreaks². However, the behaviour of *L. monocytogenes* varies with cheese types. A Belgian study, funded by Federal Agency for the Safety of the Food Chain, will help to assess these differences.

This project is composed of 2 main steps. Firstly, a large-scale survey was performed among 140 Belgian cheesemakers. Data were collected by calling every producer. Physico-chemical data are currently collected in 65 farms. Producers were selected from a sampling plan based on geographical dispersion and cheese types. Cheeses from each factory will be analysed at the day of marketing (J_0) and at the use-by date (J_{DLC}) regarding pH, water activity (a_w), and moisture and salt content, following respective ISO methods. These analytical data and process-related variables will be used to generate a tool allowing to separate cheeses in groups having the same properties or manufacture. The landscape of Belgian cheesemaking will also be drawn.

Secondly, the behaviour of *L. monocytogenes* will be evaluated in 32 cheeses sampled from all groups. Detection and enumeration tests for *L. monocytogenes* will be performed following ISO 11290-1 and 11290-2. In case of presence, cheese will undergo a shelf-life study. Otherwise, a cocktail of three *L. monocytogenes* strains isolated from dairy products will be inoculated. Inoculation will occur on rind or paste, regarding which part is the most favourable for the bacterium in terms of pH and a_w . Pathogen will then be enumerated. In both cases, cheeses will be stored at temperatures following guidelines from European Union Reference Laboratory for *L. monocytogenes*³. At J_{DLC} , levels of the bacterium will be checked to determine if the sample is suitable for listerial growth. The results could then be extrapolated for all cheeses from a same group.

¹ Commission Regulation (EC) N  2073/2005 of 15th November 2005 on microbiological criteria for foodstuffs. Official Journal of the European Union, L338, 1–26.

² Gaulin, C., Ramsay, D., & Bekal, S. (2012). Widespread listeriosis outbreak attributable to pasteurized cheese, which led to extensive cross-contamination affecting cheese retailers, Quebec, Canada , 2008. Journal of Food Protection, 75(1), 71–78.

³ European Union Reference Laboratory for *Listeria monocytogenes* (2014). EURL Lm technical guidance document for conducting shelf-life studies on *Listeria monocytogenes* in ready-to-eat foods. <https://eurl-listeria.anses.fr/en/minisite/listeria/eurl-lm-technical-guidance-document-conducting-shelf-life-studies-listeria> (accessed 25.07.17).