

## What is the landscape of artisanal cheese production in Belgium?

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Cheese has been pointed as the cause of listeriosis outbreaks worldwide<sup>1,2</sup>. In Belgium, a recall of Herve cheese recently occurred due to *Listeria monocytogenes* contamination. Indeed, Regulation (EC) N 2073/2005 asks absence of the bacterium in cheese leaving producer's control. Producers can also prove that the pathogen will not reach 100 cfu/g during the shelf-life of the product<sup>3</sup>. Before helping the producers, an in-depth knowledge of Belgian artisanal cheese landscape is required.

A survey was conducted among 246 producers with a participation rate of 70%, representing 110 Walloon and 32 Flemish farmers. Survey forms collected data on producers and livestock, manufacture, packaging and sales. A map of artisanal cheese producers was also created using QGIS.

From the interviews, 424 cheeses were considered. One third of the panel is composed of fresh cheeses, molded or not. Uncooked pressed cheeses represent 30% of the artisanal cheese production. Smear- and mold-ripened soft cheeses account for 8 and 10% of the panel. Cooked and half-cooked pressed cheeses represent 4% of the production. Some farms also produce blue-veined cheeses. Specific cheeses are met in Belgium, including *Maqu e*, *Boulette* or cheeses ripened in beer. To avoid waste, 7% of farmers use buttermilk or whey to produce buttermilk cheese or *Ricotta*, respectively.

Regarding the origin of the milk, three quarters of the cheeses are made from bovine milk, but nearly 20% are produced in goat farms. Cheese-producing sheepfolds are also met in Wallonia. Artisanal cheeses are predominantly made from raw milk (87%). Pasteurized milk is largely used in Flanders. In an artisanal way, milk is traditionally used without cooling directly after milking. A small third of the cheeses are made from low-fat milk.

Among the factories, 18% are certified as organic. Flemish factories generally produce every day. However, Wilcoxon test showed that the median of yearly cheese production in Flanders (2300 kg) does not significantly differ from those in Wallonia (1650kg).

Survey, in association with physico-chemical data, will be used to create groups of cheeses manufactured by the same way and presenting the same properties. This clustering will allow extrapolating the results of shelf-life studies with *L. monocytogenes* to all cheeses from a same group.

<sup>1</sup> Koch, J., Dworak, R., Prager, R., Becker, B., Brockmann, S., Wicke, A., ... Stark, K. (2010). Large listeriosis outbreak linked to cheese made from pasteurized milk, Germany, 2006-2007. *Foodborne Pathogens and Disease*, 7(12), 1581-1584.

<sup>2</sup> 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.

<sup>3</sup> Commission Regulation (EC) N 2073/2005 of 15th November 2005 on microbiological criteria for foodstuffs. *Official Journal of the European Union*, L338, 1-26.