

Foci of Contamination of *L. monocytogenes* in Cheese Plants of Different Sizes and Formats



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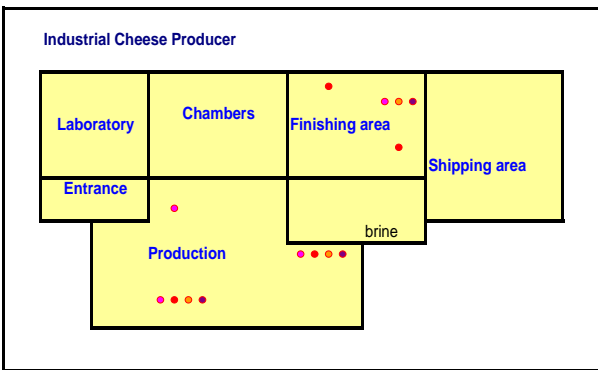
Introduction

The presence of *L. monocytogenes* in cheese has been much reported in the literature over the years. The work presented here describes the presence of *L. monocytogenes* in various sites within the factory environment of 3 companies, each producing a distinct style of cheese. All 3 chosen plants have had finished products contaminated with this bacteria. One, industrial, plant produces semi-hard cheese from pasteurized cow's milk, another (small) plant produces a number of cheeses from pasteurized cow's milk or from a mixture of ewe's, goat's and cow's milk whilst the third produces traditional artesanal cheese from raw ewe's milk.

Materials and Methods

2475 environmental samples: 1995 from the industrial plant, 340 from the small plant and 141 from traditional cheese producer, were taken from special sites within the factory employing the swab method and analysed using Vidas system. Positive results were confirmed following ISO 11290 standard. The sampling period was between 2004 and 2007.

Results



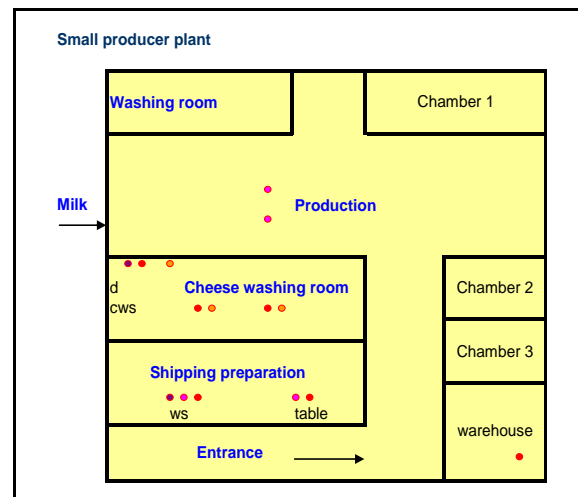
Occurrence in the Industrial Cheese Producer

Listeria spp is used as an indicator organism for *L. monocytogenes*. It was isolated from 170 samples of 1995 taken. From the 21 points usually used to control the microorganism in the production area it was isolated in drains, floor, trolley, platform and in the conveyor belt to brine. It was also isolated twice from personnel hands.

From the 276 samples taken after maturation it was isolated in 9 occasions.

In the industrial cheese producer *Listeria* spp were detected, the pathogen *L. monocytogenes* was not. In the small producer plant in 38 of the 337 environment samples collected were positive. Finally from the traditional cheese producer the pathogen was found in 29 swabs

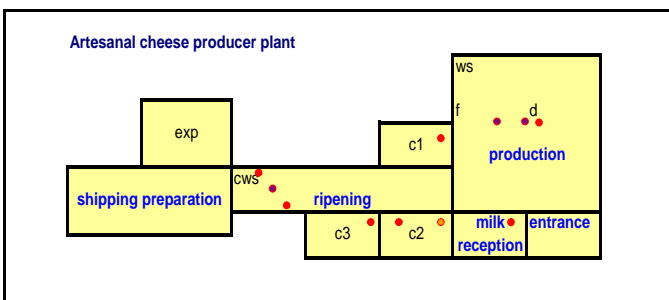
In figures 1 to 3 the areas where *Listeria monocytogenes* or *Listeria* spp in the case of the industrial cheese producer were found are indicated.



Occurrence in the Small Traditional cheese producer plant

It was isolated from 38 samples of 340 taken. *L. monocytogenes* was isolated twice in the production area from 174 samples taken. In the different stages of maturation the microorganism was isolated from the cheese washing area (sink, floor or drain) 24 in 101 samples, it was also isolated from the brushes used in this area as well from the personnel apron.

In the shipping preparation area it was isolated in 9 occasions from 35 samples taken.



Occurrence in the Artesanal cheese producer plant

It was isolated from 29 samples of 140 taken. *L. monocytogenes* was isolated in 5 of the 9 samples taken at milk reception area or personnel entrance of the dairy. In the production area it was isolated 5 times from drain or floor in 57 samples taken. In the different stages of maturation the microorganism was isolated from the chamber or in the cheese washing area (sink or floor).

Legend

- Strains isolated in 2004
- Strains isolated in 2005
- Strains isolated in 2006
- Strains isolated in 2007

Exp – warehouse; c1-c3 chambers; f-floor; d-drain; cws- cheese washing sink; ws-washing sink

Conclusion

In the production areas the micro organism was isolated mainly from drains.

In the small factory that produces cheese from pasteurized milk *L. monocytogenes* was found mainly in the cheese washing area and in the shipping preparation zone. This represents a serious problem for the factory even though samples of cheese produced during this period proved negative. In the traditional raw milk cheese producer the bacterium was isolated at milk reception, in the production area, in maturation chambers and in the cheese washing area; positive samples of cheese were also found although numbers of *Listeria* were always lower than 100 cells/g.

References

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Acknowledgments

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