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The use of challenge studies to explore the fate of *Listeria monocytogenes* in artisanal cheese varieties from Belgium (Part. 2)

RESULTS

Types of cheese	pH (D0)	Water activity (D0)	Dry matter (%) (D0)	Range of δ (EURL *Lm*)	N batches with growth of *L. monocytogenes* (EURL *Lm*)	Range of δ (EURL *NVWA*)	N batches with growth of *L. monocytogenes* (NVWA)	Range of δ (EURL *FASFC*)	N batches with growth of *L. monocytogenes* (FASFC)
Unripened acid-curd	4.4±0.1	0.99±0.01	25.9±9.7	-1.59 – -0.48	0/12	-1.59 – -0.48	0/12	-1.44 – 0.00	0/12
Mold-ripened soft	5.8±0.6	0.97±0.02	50.1±3.0	-0.20 – 4.70	10/12	0.80 – 4.73	11/12	0.83 – 5.36	12/12
Smear-ripened soft	5.7±0.3	0.97±0.01	49.9±4.1	-1.10 – 2.68	7/12	-1.10 – 2.75	8/12	-0.35 – 2.93	8/12
Gouda-type	5.9±0.1	0.96±0.0	60.2±5.3	-1.49 – 1.19	1/12	-1.49 – 1.19	2/12	-1.36 – 1.23	2/12
St-Paulin-type	5.7±0.2	0.96±0.0	59.5±4.6	-0.94 – 0.93	1/20	-0.94 – 2.52	5/20	-0.70 – 2.76	6/20

CONCLUSIONS

L. monocytogenes was unable to grow in all 12 batches of unripened acid-curd cheeses from this study. A new circular (PCCB/S3/1636380) was published by Federal Agency for the Safety of the Food Chain (FASFC), recognizing that these cheeses, with pH < 5 at the end of manufacture, are not risky regarding this pathogen. Before sales, 100 cfu/g are now tolerated. This new criteria is currently only valuable in Belgium.

- pH and water activity theoretically insufficient to prevent the growth of *L. monocytogenes* in other types of cheese;
- Pathogen able to develop in some samples of all other varieties;
- Important variability in δ;
- Up to 5,000,000 cfu/g at the end of the test in some mold-ripened cheeses;
- Generally no growth in Gouda-type cheeses.

- Differences between methods for δ calculation;
- Especially for St-Paulin-type cheeses;
- Inter-batch variability not taken into account by the reference method (EURL *Lm*).

⇨ **Reference method leads to erroneous conclusions regarding food safety when intra-batch variability > 0.5 log cfu/g**

- NVWA and FASFC methods more accurate in these conditions;

⇨ **Required revision of EURL *Lm* guidelines to improve precision on the most accurate calculation method**

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