## When the solution is part of the problem – A *Listeria monocytogenes* case study of an alpine cheese dairy

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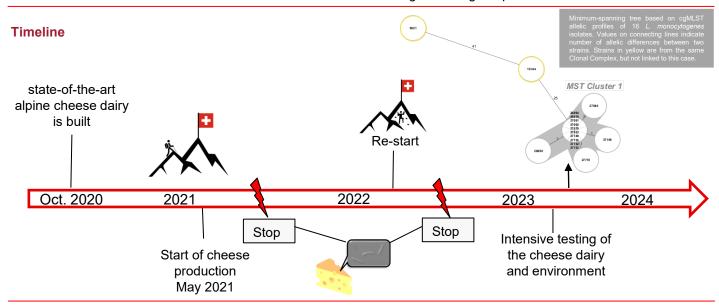


Products from alpine cheese dairies may be at higher risk of contamination with *L. monocytogenes* for the following reasons:

- · proximity to farm surroundings
- environmental conditions
- · seasonal personnel changes
- · limited infrastructure



The damage caused by *L. monocytogenes* can be economically significant, especially due to the short period of seasonal cheese production. Accordingly, cheese makers try different mitigation strategies, consisting primarily of a strong focus on hygiene measures, and traditionally, choosing cheese varieties less prone to contamination, e.g., with a high scalding temperature.



- > Intensive testing of the environment in order to find the source of contamination in 2023
- > Five samples tested positive including smear water, cheese cellar swabs & spring water (2L) before UV-treatment
- > These isolates, together with some isolates from 2021 and 2022 were sequenced
- > Ridom SeqSphere was applied for cgMLST analysis of the genomes
- > All isolates clustered and belonged to the same Complex Type (MST Cluster 1) including those of 2021 and 2022

## Discussion

Because the water tested positive, it was assumed that the strain entered the water reservoir through flooding and repeatedly contaminated the cheese dairy from there. The same strain was found at a neighboring cheese dairy, which draws its water from the same reservoir, which supports this assumption. Figure A shows that the cover of the reservoir was installed too close to the ground and was unprotected. Rainwater, together with particles from the meadow above, may have clouded the water so that the UV system could no longer disinfect the water efficiently. In addition, short power cuts could also have affected the operation of the UV. The reservoir was cleaned and the old cover was replaced with a taller and closed one (Figure B).





## Conclusion

This case shows that testing water in sufficient quantity and sensitivity is important for alpine farms. Although UVsystems are available for decontamination of spring water, it must be investigated whether external influences such as thunderstorms (that could increase water turbidity) have an impact on their reliability.

This work will help to avoid contaminations in the future and/or to find the source of contamination more rapidly.







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