







## Pathogenicity and virulence of Listeria monocyotogenes isolates from dairy farms

Ana Rita Barata <sup>1,2</sup>, Bárbara Nunes <sup>1,3</sup>, Teresa Nogueira <sup>1,4</sup>, Maria José Saavedra <sup>2,3,5</sup>, Gonçalo Almeida <sup>1,6(\*)</sup>

<sup>1</sup> National Institute of Agricultural and Veterinary Research, I.P (INIAV), Vila do Conde, Portugal <sup>2</sup> Escola de Ciências da Vida e do Ambiente, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Portugal

<sup>3</sup> Departamento das Ciências Veterinárias, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Portugal <sup>4</sup> Centre for Ecology, Evolution and Environmental Changes (cE3c) & Global Change and Sustainability Institute (CHANGE), Faculdade de Ciências da Universidade de Lisboa, Lisboa, Portugal <sup>5</sup> Centre for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB) & Institute for Innovation, Capacity building and Sustainability of Agri-Food production (Inov4Agro), University of Trás-os-Montes e Alto Douro, Vila Real, Portugal

<sup>6</sup> Center for Animal Science Studies - Institute of Agricultural and Agro-Food Sciences and Technologies (CECA-ICETA), University of Porto, Porto, Portugal

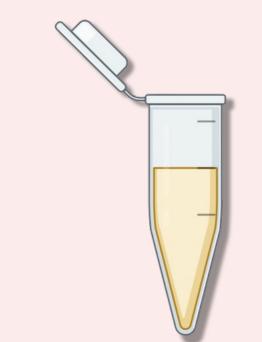
## Introdution

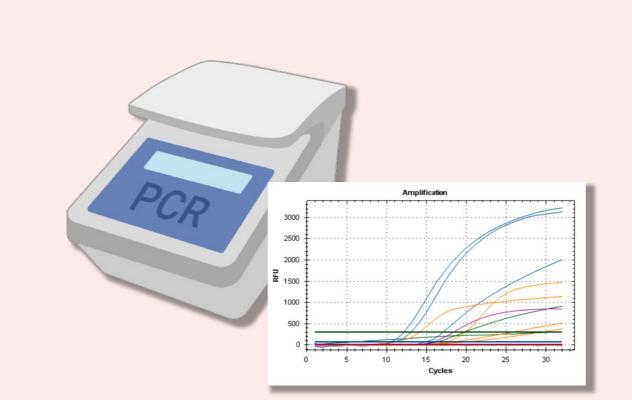


Listeria monocytogenes serves as foodborne pathogen capable of inducing listeriosis in human and animal hosts. Its remarkable capacity to adapt to a wide range of stress conditions across diverse environments has played a significant role in its widespread distribution.

# Objectives Identification of serogroups Distinguishing clonal complexes Genomic characteristics of isolates Virulence and stress adaptation genes

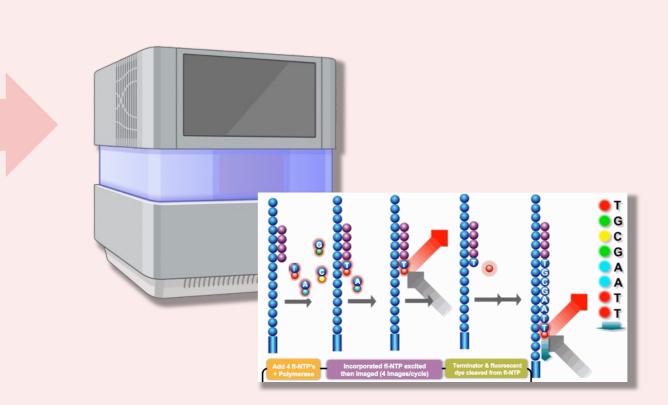
#### DNA extraction





Identification of serogroups

Sequencing by Illumina

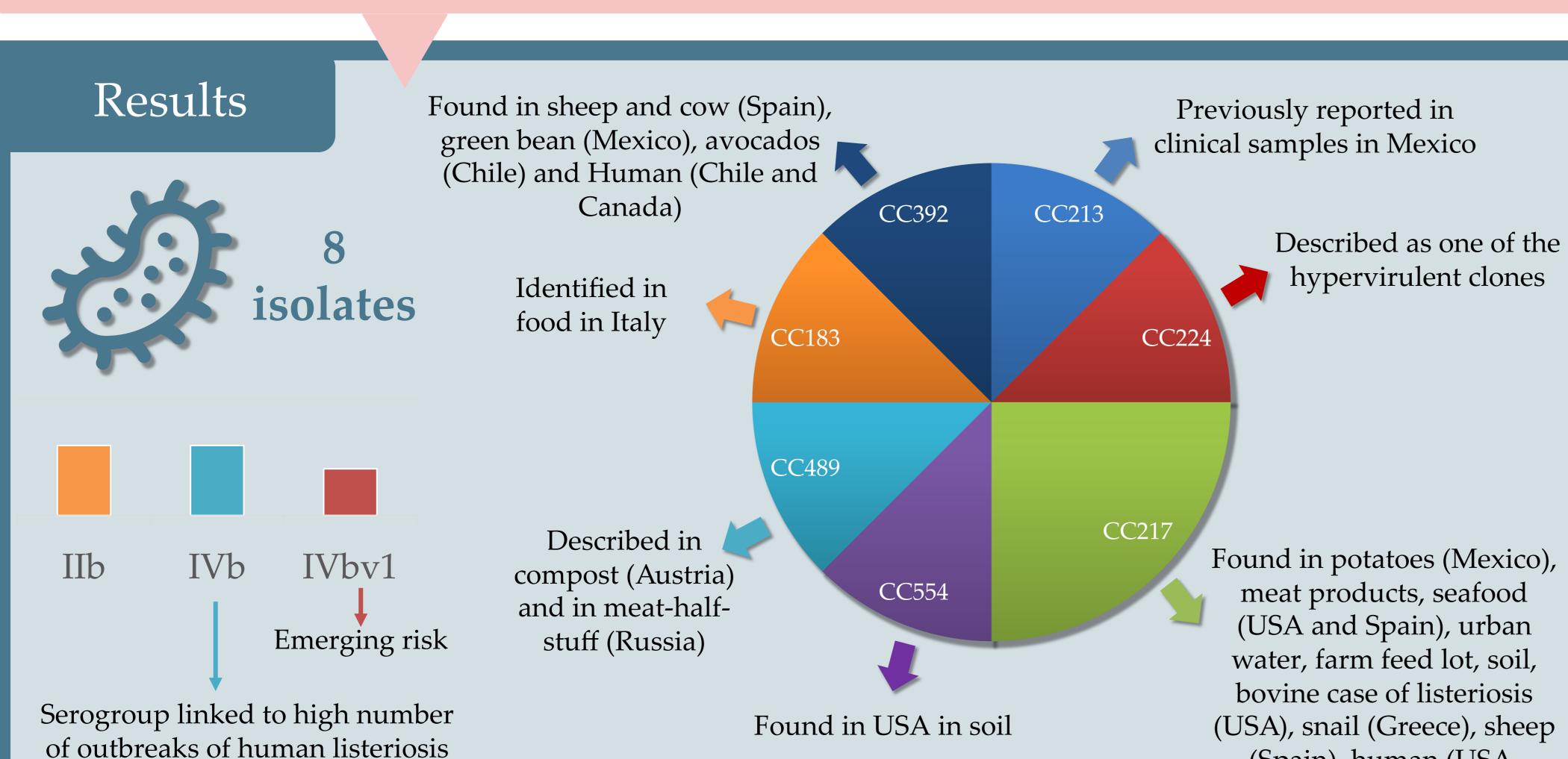


### Materials and methods



Characterization of isolates

Isolates collection



LIPI-1 100% SSI-1 LIPI-3 25% Stress survival genes SigB LIPI-4 100% **50%** 

## Conclusions

This study has caracterized isolates of *L. monocytogenes* from dairy farms and discover the main clonal complexes, some were implicated in human cases of listeriosis. Persistence strains in food production environment has been associated to the presence of stress survival islets, that were detected in this study. The prevalence in the agricultural environment highlights the importance of understanding the ecology and the need to increase measures that can reduce its presence through food chain, increasing food safety.

#### References

S. Tsaloumi, Z. Aspridou, E. Tsigarida, F. Gaitis, G. Garofalakis, K. Barberis, F. Tzoumanika, M. Dandoulaki, R. Skiadas, K. Koutsoumanis, Quantitative risk assessment of Listeria monocytogenes in ready-to-eat (RTE) cooked meat products sliced at retail stores in Greece, Food Microbiol. 99 (2021) 103800. doi: 10.1016/j.fm.2021.103800. E. Doster, S.M. Lakin, C.J. Dean, C. Wolfe, J.G. Young, C. Boucher, K.E. Belk, N.R. Noyes, P.S. Morley, MEGARes 2.0: a database for classification of antimicrobial drug, biocide and metal resistance determinants

in metagenomic sequence data. Nucleic Acids Res. 48 (2020) D561-D569. doi: 10.1093/nar/gkz1010. S. Al, H.B. Disli, H. Hizlisoy, N.E. Onmaz, Y. Yildirim, Z. Gonulalan, Prevalence and molecular characterization of Listeria monocytogenes isolated from wastewater of cattle slaughterhouses in Turkey, J Appl Microbiol. 132 (2022) 1518–1525. doi: 10.1111/jam.15261.

C. Matto, G. Varela, V. Braga, V. Vico, R.E. Gianneechini, R. Rivero, "Detection of Listeria spp. in cattle and environment of pasture-based dairy farms, Pesquisa Veterinária Brasileira. 38 (2018) 1736-1741. doi: 10.1590/1678-5150-pvb-5663.



(Spain), human (USA,

Canada and Spain)



