

# From Waste to Safety: Black Soldier Fly Larvae Mitigate Pathogens and Proteins from Animal Origin in Food Waste Valorisation

Joana Oliveira<sup>1</sup>, Carolina Ligeiro<sup>1</sup>, Rafaela Fantatto<sup>1,3</sup>, Clarice Souza<sup>1,3</sup>, Miguel L. Grilo<sup>1,2</sup>, Carina Carvalho<sup>1</sup>, Alexandre Trindade<sup>1</sup>, Daniel Murta<sup>1,3</sup>, Ricardo Assunção<sup>1,4</sup>

<sup>1</sup>Egas Moniz Center for Interdisciplinary Research (CiiEM); Egas Moniz School of Health & Science, Portugal; <sup>2</sup>MARE—Marine and Environmental Sciences Centre/ARNET—Aquatic Research Network, Ispa—Instituto Universitário de Ciências Psicológicas, Sociais e da Vida, Portugal; <sup>3</sup>Ingredient Odyssey SA – EntoGreen, Portugal; <sup>4</sup>National Institute of Health Dr. Ricardo Jorge, Food and Nutrition Department, Portugal

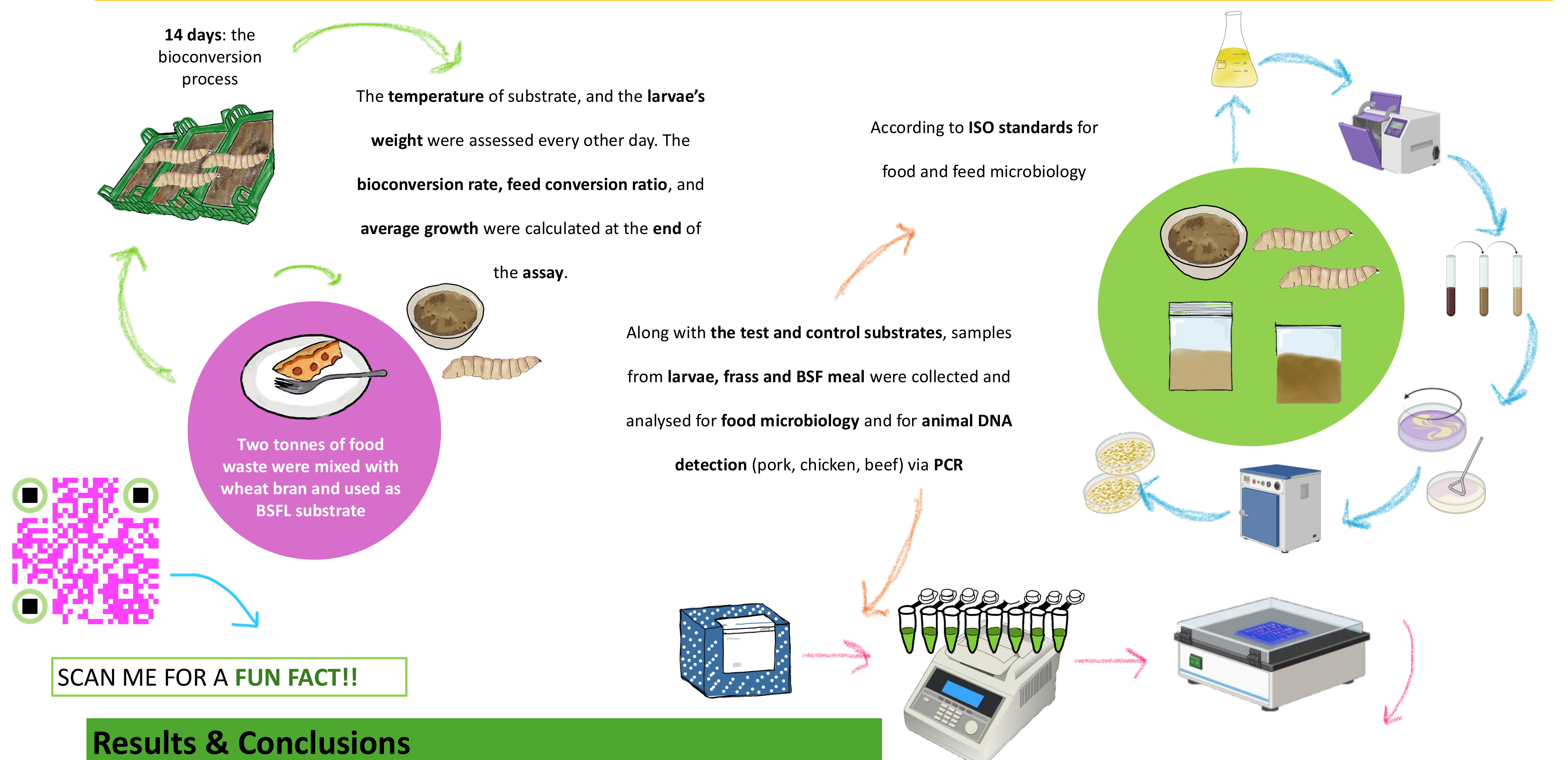
## Background

Every year, 59 million tonnes of food are wasted in the European Union (EU). This threatens the sustainability and resilience of our agrifood systems and contributes to public health problems. In recent years, black soldier fly larvae (BSFL) have emerged as a potential waste management solution, as they can transform organic matter into new products such as animal feed and soil fertiliser. The larvae can also bioremediate contaminants, removing or reducing them to acceptable levels. However, the EU currently prohibits using food waste as an insect substrate due to the potential presence of contaminants that cause foodborne illnesses, and animal proteins.

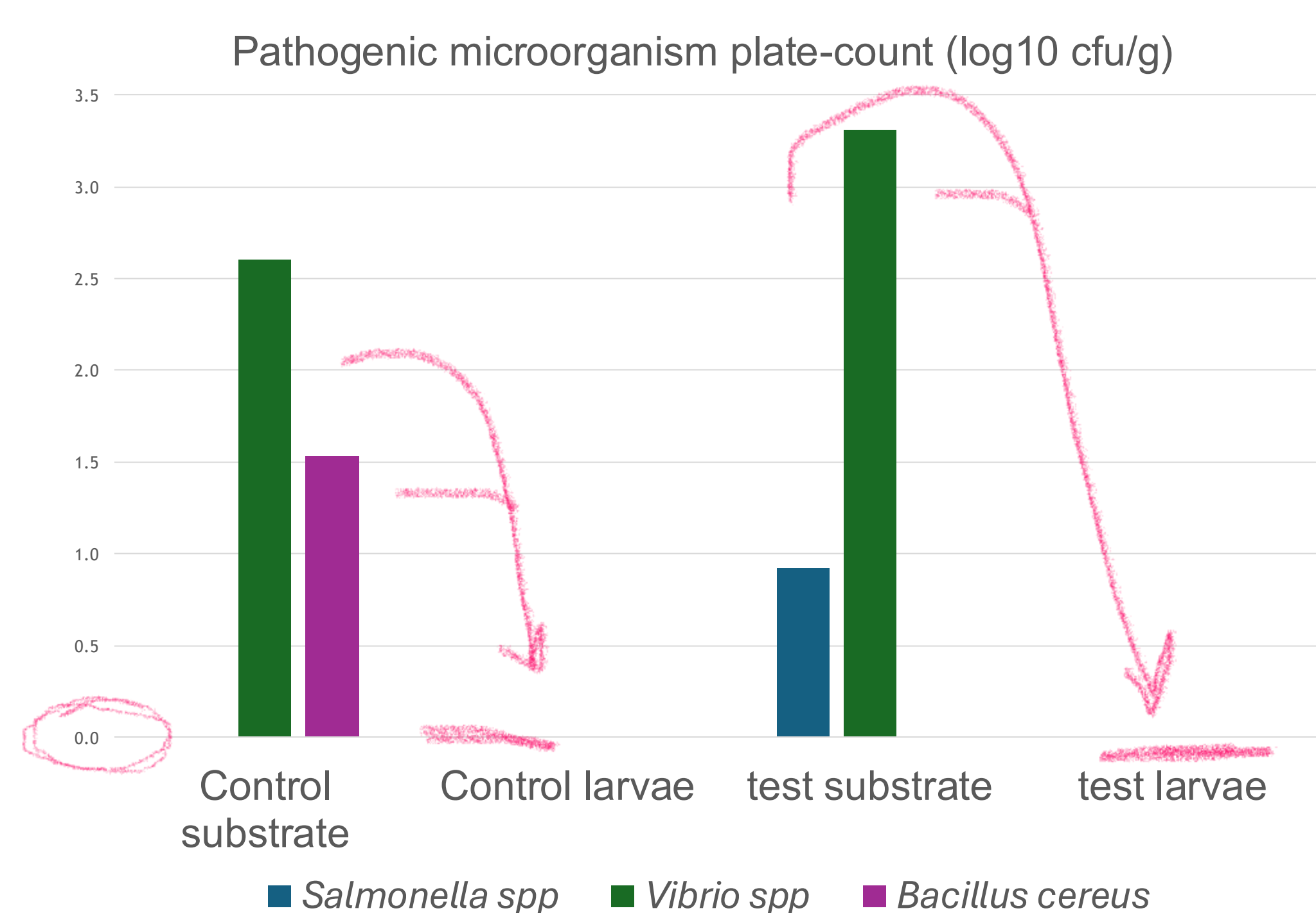
## Objectives

This study evaluated the bioremediation potential of foodborne pathogens (specifically bacteria) by BSFL and determined whether the larvae bioaccumulate animal proteins

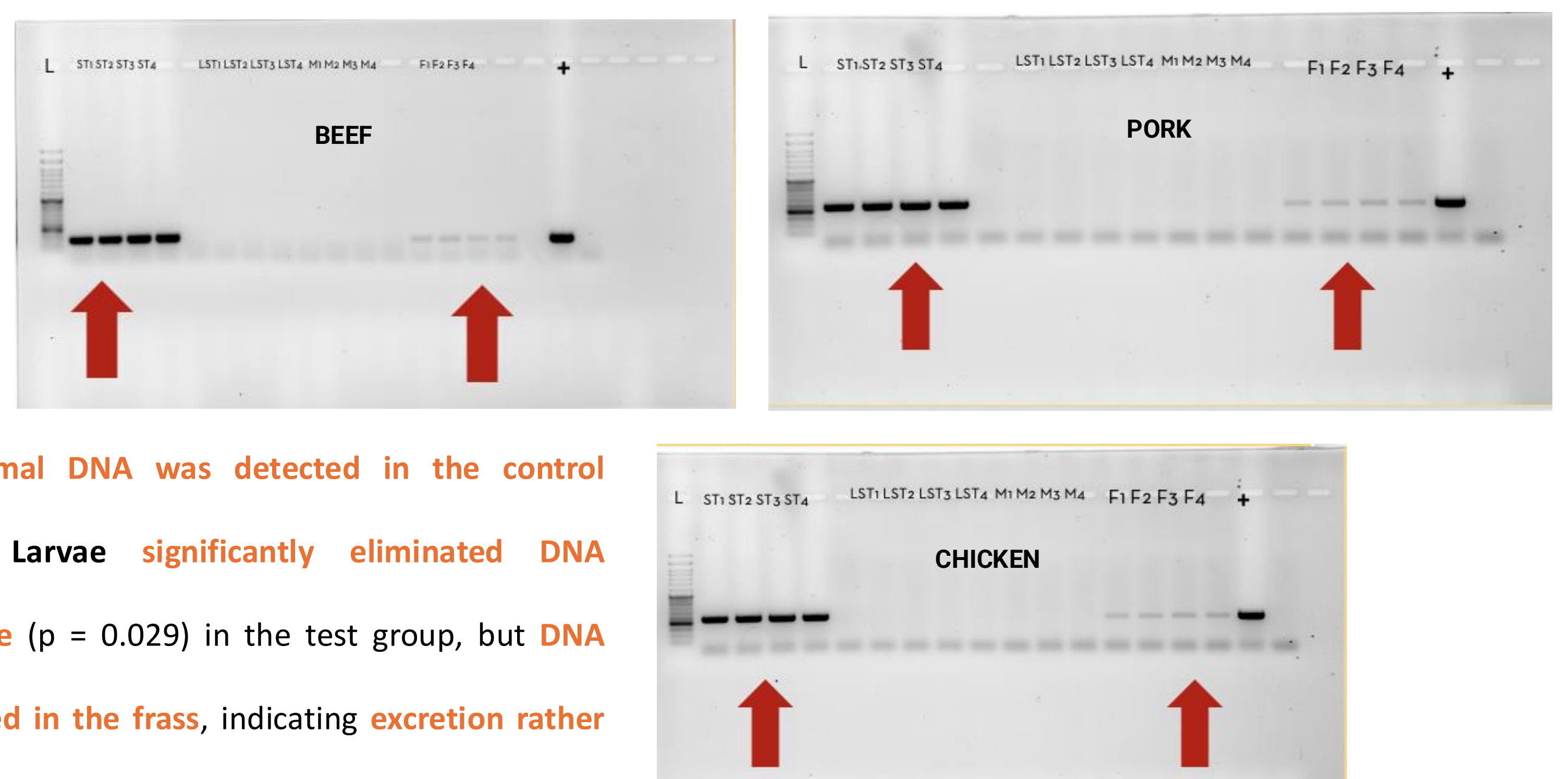
## Methods



## Results & Conclusions



The results indicated that **the larvae reduced** ( $p = 0.015$ ) the count of *Salmonella* spp., *Bacillus cereus* and *Vibrio* spp. to **zero** (Fig. 3), suggesting a **bioremediation effect**.



No animal DNA was detected in the control group. Larvae significantly eliminated DNA presence ( $p = 0.029$ ) in the test group, but DNA remained in the frass, indicating excretion rather than accumulation.

These findings emphasise the **potential of BSFL for the safe bioremediation of food waste** containing pathogenic bacteria and proteins from animal origin, thus supporting their integration into circular,

One Health-aligned systems.

## References

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## Acknowledgements

This study is funded by a PhD grant by Fundação para a Ciência e Tecnologia (grant number 2022.13540.BDANA; <https://doi.org/10.54499/2022.13540.BDANA>); by "InsectERA" (Project No. C644917393-00000032) within the WPs InBioremediation and One Health, funded by Next Generation EU European Fund and the Portuguese Recovery and Resilience Plan (PRR), under the scope of the incentive line "Agendas for Business Innovation" through the funding scheme C5—Capitalization and Business Innovation, and by CiiEM Investiga "Flywaste", through Project 10.54499/UIDB/04585/2020, funded by FCT.