

# Development of a quantification method for *Salmonella* enumeration on pig carcasses

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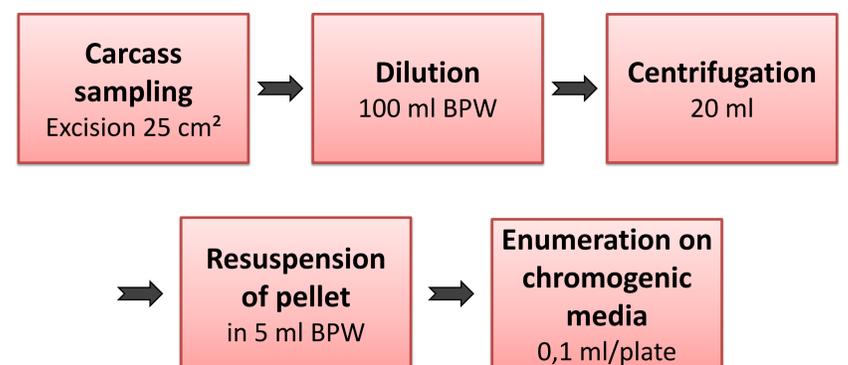
Slaughterhouses are a key step to control *Salmonella* contamination on pork products (EFSA, 2010). However, knowledge about *Salmonella* contamination on pig carcasses is essentially qualitative. This project aims at developing a method to enumerate *Salmonella* on pig carcasses in order to lower the quantification threshold and to facilitate its use in laboratories and slaughterhouses. The end goal is to quantitatively assess the contamination by *Salmonella* on pig carcasses.

## Materials and Methods

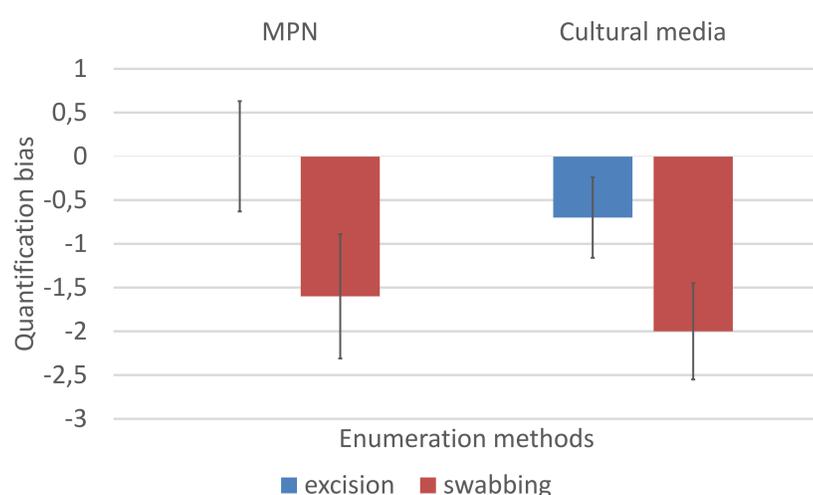
- Various quantification methods were tested on artificially contaminated rind samples in order to identify the best method in terms of quantification threshold, practicability and cost.
- Salmonella* enumerations were compared for different sampling methods (excision or swabbing), sampling sizes (25 cm<sup>2</sup>, 100 cm<sup>2</sup> or 500 cm<sup>2</sup>), concentration techniques (immuno-concentration, centrifugation or filtration) and enumeration methods (standard method ISO 6579-2: miniaturized MPN or chromogenic media).

## Results

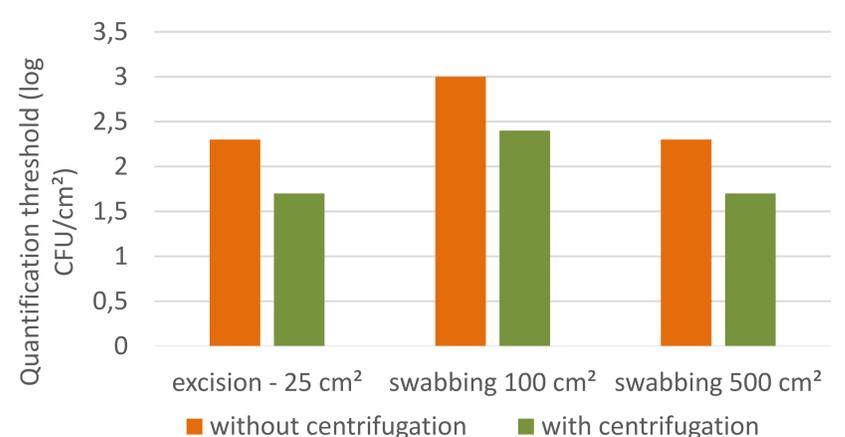
- Excision had a better repeatability than swabbing with a bias of 0 log CFU/cm<sup>2</sup> for excision and up to -1 log CFU/cm<sup>2</sup> for swabbing.
- The performance of the three chromogenic media tested are equivalent whatever the sampling method. The reproducibility was better than for the MPN method.
- Centrifugation appeared to be the most powerful method that allowed to lower the quantification threshold of 0.7 log with no significant negative effect on reproducibility.



**Figure 1** – Optimized method for *Salmonella* quantification on pig carcass.



**Figure 2** – Comparison of *Salmonella* quantification bias by MPN or by chromogenic media for artificially contaminated rind sampled by excision (25 cm<sup>2</sup>) or by swabbing (100 or 500 cm<sup>2</sup>).



**Figure 3** – Comparison of *Salmonella* quantification bias by MPN or by chromogenic media for artificially contaminated rind sampled by excision (25 cm<sup>2</sup>) or by swabbing (100 or 500 cm<sup>2</sup>).

## Conclusion

- The best method for *Salmonella* quantification combined excision, centrifugation and enumeration on chromogenic media
- The threshold of this method is 1.7 log UFC/cm<sup>2</sup>
- An evaluation on naturally contaminated carcasses in different slaughterhouses will help to understand *Salmonella* contamination and persistence during the slaughtering process and the setting up of preventive measures to control *Salmonella* contamination.

