

## Estimation of LOD of Detection of *Proteus* spp. in Surface Samples

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### INTRODUCTION & AIM

- ❑ Microbiological contamination of surfaces in food production facilities and food-handling areas represents a major challenge in preventing cross-contamination and selecting biocidal products.
- ❑ Consequently, examining the microbiology purity of surfaces that come into contact with food requires a serious methodological approach.
- ❑ Bacteria of the genus *Proteus* cause food spoilage
- ❑ The presence of *Proteus* spp. on the surface of food processing equipment is a sign of poor or improper sanitation and hygiene practices

### METHOD

- This paper presents the method of determination of *Proteus* spp. from surface samples (5x5 cm<sup>2</sup>).
- The three levels of artificial soiled aluminium foil were prepared using suspension density 0.5 McF of *Proteus hauseri* ATCC 13315:
  - I level: 290 CFU/25 cm<sup>2</sup>
  - II level: 725 CFU/25 cm<sup>2</sup>
  - III level: 5800 CFU/25 cm<sup>2</sup>.
- After the surface swabbing with a cotton swab stick, the method for determination of *Proteus* spp. was applied.
- The swab was homogenised with 25 ml Eugon LT 100 broth and 1 mL was transferred to Nutrient broth.
- After incubation of Nutrient broth (18±2 h at 37±1°C), streaking on the Brilliant green agar and SS agar was performed, followed by plates incubation 24±2h at 37±1°C
- Biochemical reactions confirmed the colonies with characteristic morphology.
- The number of positive findings of *Proteus hauseri* on the applied level of contamination was used for calculation by the PODLOD\_ver12.xls ECEL program by Wirlich and Wilrich
- This program estimates the probability of detection (POD) function and the limit of detection (LOD) of qualitative microbiological methods.

### RESULTS & DISCUSSION

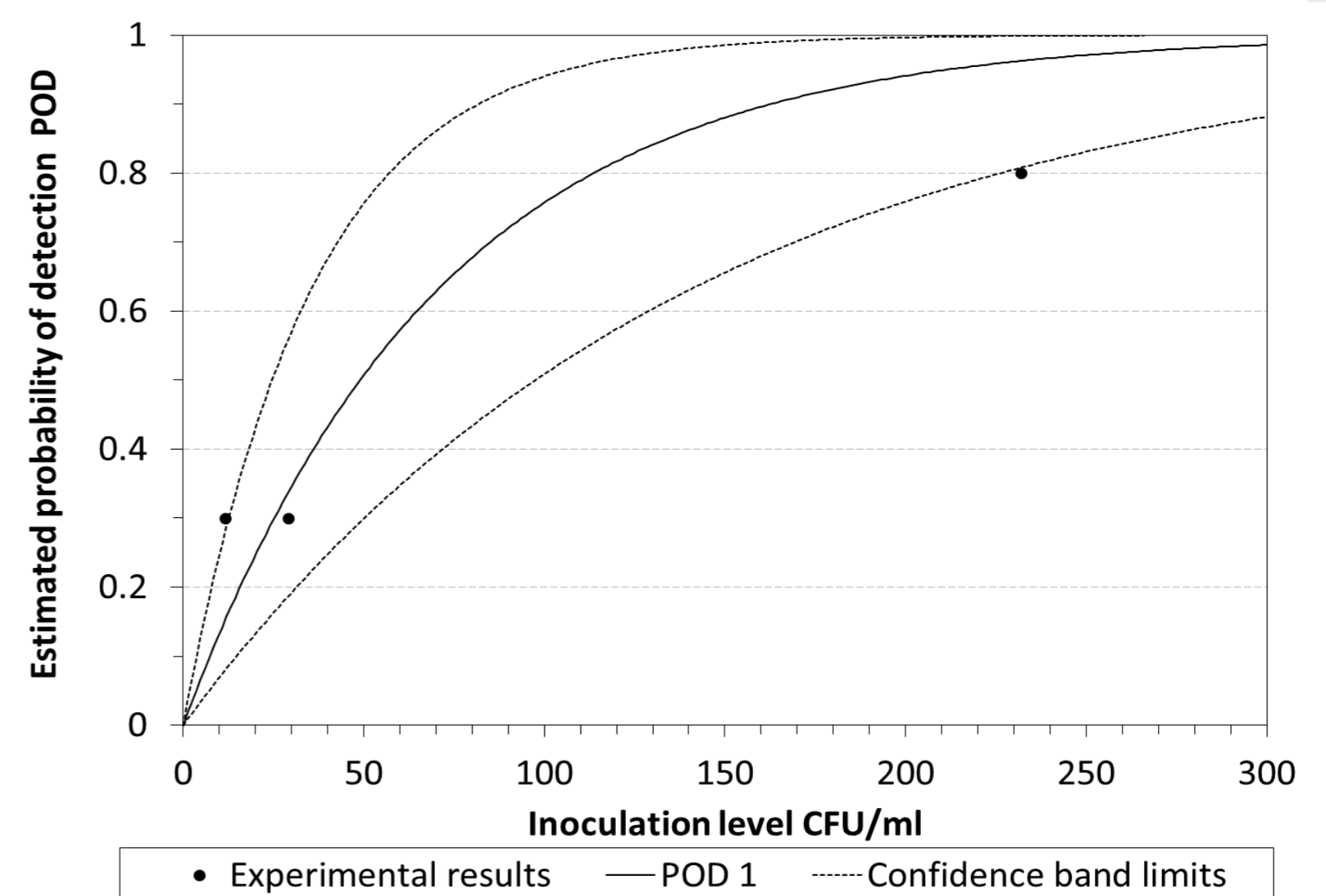


Figure 1. Estimated POD curve of the combined ideal method and its 95% confidence band

- ❖ The results of the detection of *Proteus hauseri* in surface samples showed
  - ✓  $LOD_{50\%} = 48.957 [24.596; 97.446]$  CFU in 1 ml of swab rinse,
  - ✓  $LOD_{95\%} = 211.589 [106.303; 421.155]$  CFU in 1 mL of swab rinse.
- ❖ The applied method is not suitable for low-level contamination of surfaces

### CONCLUSION

- The methods of surface sampling and isolation of microorganisms have a key role in the inspection of surface safety in the food industry
- The applied method for the isolation of *Proteus* spp. from a surface sample is suitable for highly contaminated surfaces

### FUTURE WORK

● research related to the type of surface, the kind of sampling used tool, and the type of microorganisms tested