

Comparison of RODAC plates and Petrifilm™ to assess the microbial contamination of food-contact surfaces: importance of additives

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Introductory summary: Assessing the microbial contamination level of surfaces is critical in environments where high hygiene levels are required. This is typically the case in food and catering industries or in hospitals and medical appliances. On a routine base, RODAC plates and other techniques based on microbial transfer are generally used to quantify the microbial load of a surface. There are however still polemics on the limitations and performances of these techniques arising from the fact that the initial contamination level of a surface is never known and due to the difficulty of reproducing field conditions in laboratory environments. The present study brings further information in that direction.

Methods: An experimental design was conceived in order to compare RODAC plates and Petrifilm™ on stainless steel and high density polyethylene (HDPE), two relevant surfaces for food environments. The surfaces were contaminated with *Staphylococcus epidermidis* (NCIB 9993) at a low (4 CFU/cm²) and a high (20 CFU/cm²) level. In order to simulate more relevant sampling conditions, albumin or Tween 80 were eventually added to the inoculums (Originally containing bacteria suspended in Ringer).

Results and conclusions: The experiments showed that the recovery rates were highly influenced by the presence of additives for both methods, suggesting a bacterial adhesion process mainly influenced by capillary forces. Petrifilm™ were more efficient on both surfaces for inoculums containing only Ringer or Tween 80. This aspect was investigated through force analysis, which suggested that the observed differences might be attributed to differences in gelose compositions.

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