

The development of a proficiency testing sample for surface swabbing

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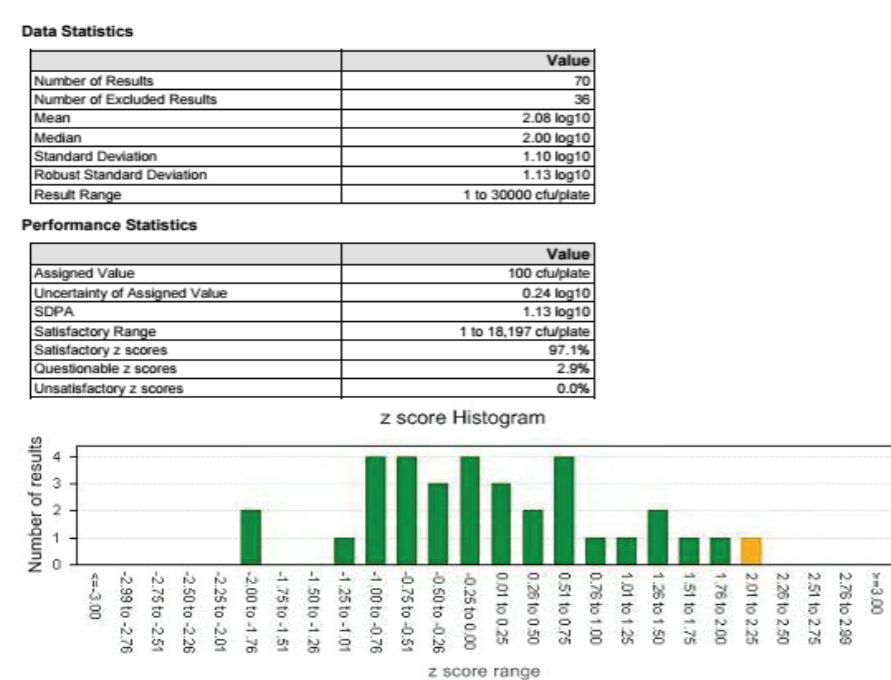
Hygiene monitoring in the factory and laboratory environment is an important tool, used to minimise the risk of product contamination, and monitor the efficacy of cleaning processes. A range of techniques are routinely performed by laboratories including surface swabbing, contact plates, settle and impact plates, dipslides, and ATP monitoring.

A proficiency testing scheme for surface swabbing

A surface sampling proficiency testing sample has been developed at LGC Standards Proficiency Testing in order to assess analyst competency when using surface swabbing techniques. The first sample developed at LGC Standards PT consisted of a sterile plastic surface that had been inoculated with microorganisms. Results returned by participants displayed wide distributions and it was not possible to ascertain if this was due to variations in swabbing techniques leading to varied levels of recovery or sample quality/stability.

See **Fig 1**. Results of swabbing for Enterobacteriaceae, a robust standard deviation (RSD) of 1.13 log₁₀ was observed. Typical LGC PT microbiology schemes use an SDPA (standard deviation for proficiency assessment) of 0.35 log₁₀ based on historical RSD data.

Fig.1 Results from HY01 swabbing for Enterobacteriaceae.



Sample Development

An alternative sample format was presented which eliminated any issues regarding sample quality/stability and also enabled participants to directly enumerate the inoculum alongside analysis using the usual swabbing techniques. A sterile plate was provided with a spiked tablet and a diluent, detailed instructions were provided and participants were able to directly enumerate the inoculum and also analyse the surface using swabbing techniques. This enables LGC PT and participants to assess the recovery of organisms from a surface using swabbing techniques.

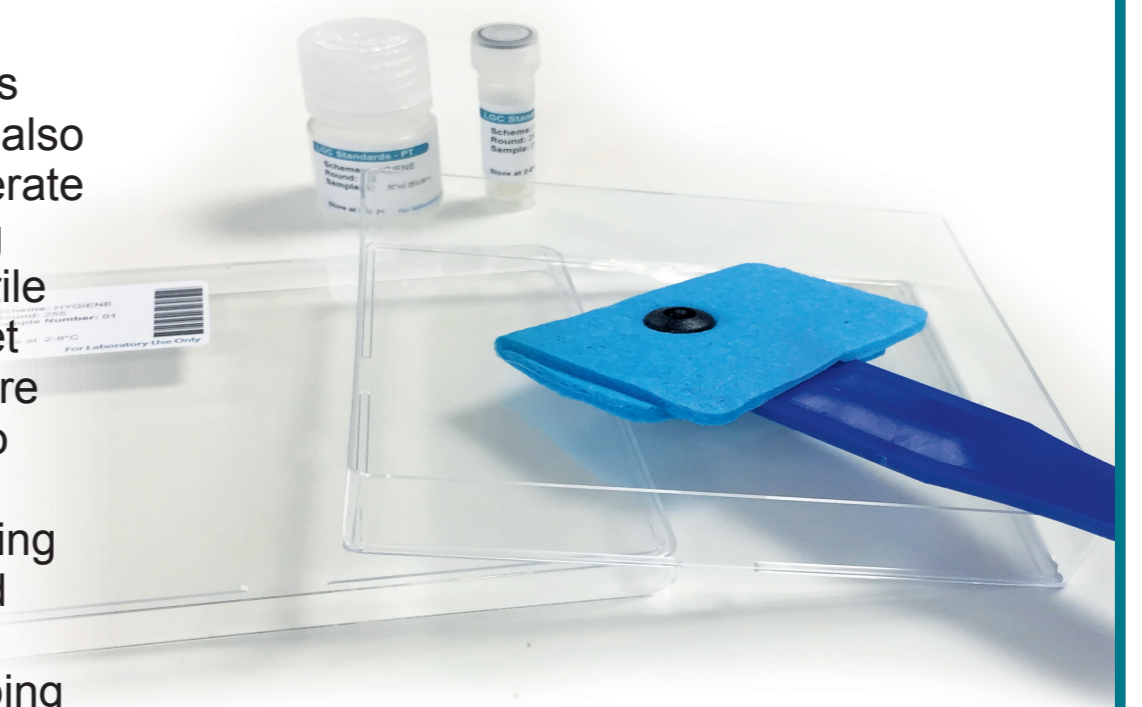


Fig. 2 Direct enumeration of the inoculum - sample HY01255 Enterobacteriaceae analyte

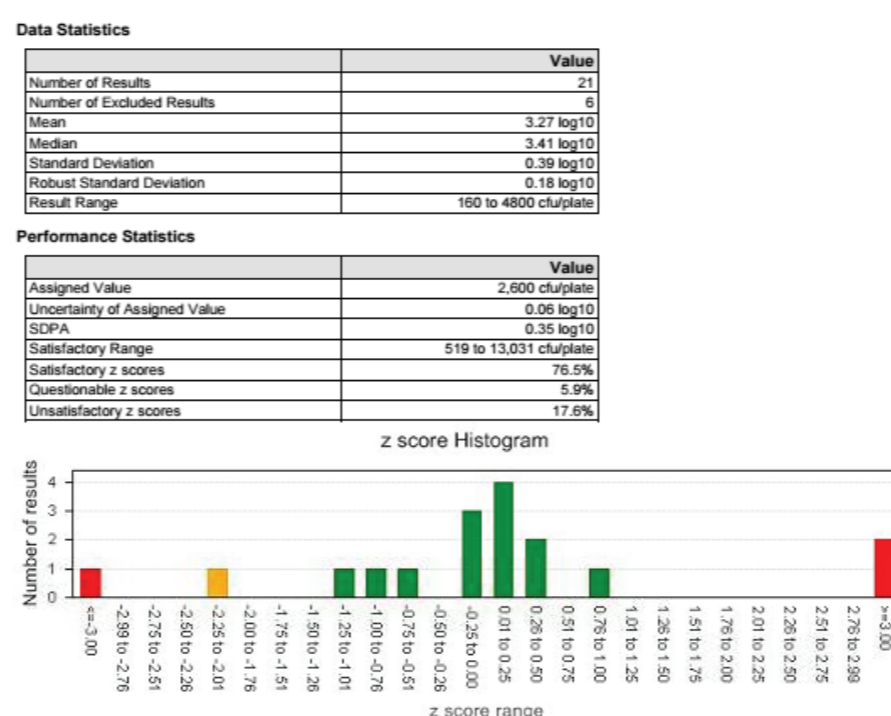
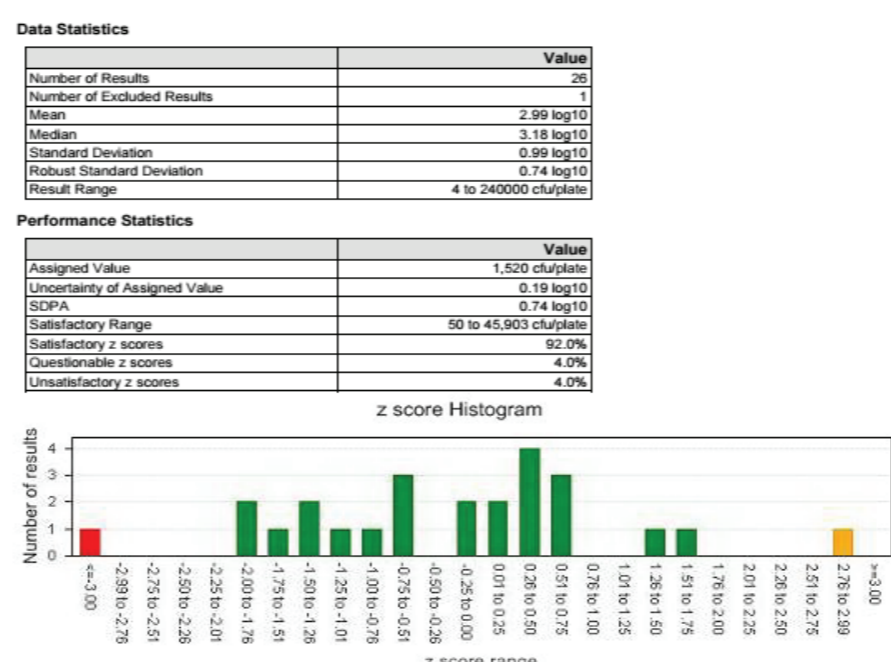


Fig. 3 Analysis of the sample using swabbing techniques - sample HY01255 Enterobacteriaceae analyte



Results

Upon comparing the direct and swabbing results it is clear to see that the direct count (Fig. 2) has a much lower participant RSD (0.18 log₁₀) and a higher assigned value (2,600 cfu) when compared to the swabbing analysis (Fig. 3) which gave a participant RSD of 0.74 log₁₀ and an assigned value of 1,520 cfu. The higher RSD for the swab analysis is due to the variability of the swabbing techniques used which may include swab type, diluent type, analyst etc. On this occasion the assigned value for swab analysis gives a recovery of 58% compared to the direct analysis indicating that not all organisms present on a surface will be recovered using swabbing techniques.

Data has been collated over three rounds to assess the percentage recovery.

Percentage recovery over three rounds:

	HY249	HY251	HY255
TVC	22%	38%	20%
Yeast	7%	N/A	32%
Mould	N/A	15%	N/A
Yeast and Mould	6%	20%	67%
Enterobacteriaceae	16%	32%	58%

Summary

Results indicated that the recovery of microorganisms from a surface can indeed vary. Analysts should consider that if organisms are recovered during routine testing it is possible that the true level of surface contamination could be much higher. The LGC PT Hygiene scheme will continue to run in this revised format to provide vital feedback to participants on their performance when using swabbing techniques.