Swabbing Efficiency of Hygiena's *Listeria* Swab (MicroSnap® Surface Express, *L. mono* GLO)

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One Health Diagnostics™

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MicroSnap®

INTRODUCTION:

Swabbing is often used as a method to determine how many microbes are present on a surface as part of an environmental monitoring plan.

To measure swabbing efficiency, it is important to validate a method that accomplishes this and takes into account the bacteria both picked up during swabbing but also left behind on the surface.

This method, based upon Griffiths and Mansel, demonstrates simple methodology to allow full drying of bacteria or matrix onto a surface and subsequent pick-up by the swab and remnants left behind.

This methodology allows for assessment of different swab sizes, swabbing agents and usage scenarios for users.

PURPOSE:

To test the efficacy of swabs at removing bacteria dried onto food testing surfaces.

REGISTERED TRADEMARKS:

METHOD:

Culture preparation

The following cultures, *Listeria monocytogenes* (ATCC 7655, 51780, 19111), *E. faecalis* (ATCC 51299, 49533, 51742), *L. innocua* (ATCC 51742, 43547, 11288) and *L. ivanovii* (BAA 753, ATCC 49953) were grown overnight. Dilutions of these bacteria were made in PBS. 100 µL was applied by dotting 10 x 10 µL volumes onto 4" x 4" stainless steel surfaces. Surfaces were then allowed to dry overnight in a laminar flow hood.

Swabbing

The next day, dry surfaces were swabbed using the MicroSnap® Surface Express *L. mono* GLO with coupons with the highest dilutions first. From the swab bud, 10 µl was removed and added to 90ul of PBS and plated on TSA plates to estimate the total bacteria present.

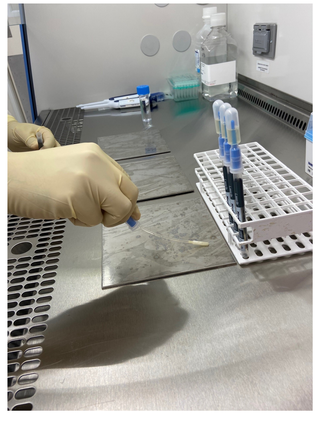
This was repeated for all dilutions and replicated several times over several days to verify accuracy.

METHOD:

The swabbed area was transferred to sterile petri dishes and then overlaid with cooled non-selective molten agar to cover the coupons.

The molten agar was allowed to solidify and incubated at 37 °C to visualise the remaining CFUs of *Listeria*. This process was repeated with all the coupons.

All the *L. mono* GLO devices were incubated at 37 ºC.



RESULTS:

Survival from surface drying was estimated using the CFUs from the swab and adding the counts from the overlaid agar. This was divided by the overnight counts from each culture. The survivability was as follows:

L. mono (0.74%, 0.93% and 0.21%), for *E. faecalis* (0.24%, 0.25% and 0.02%), for *L. innocua* (0.0006%, 0.01% and 0.04%) and *L. ivanovii* (0.03% and 0.006%).

The swabbing efficiency was estimated by dividing the CFU count from the swab with the sum of the overlaid agar count and the swab CFU.

Swabbing efficiency was as follows: For *L. mono* (96.7%, 97.9% and 89.6%), for *E. faecalis* (95.9%, 95.1% and 91.8%), for *L. innocua* (97.2%, 90.9% and 85.7%) and for *L. ivanovii* (94.6% and 94.4%), respectively.

CONCLUSIONS:

The swabbing of surfaces needs to be proven to allay any misconceptions that smaller swabs are less efficient. If the area being swabbed is not too large or too wet, then the swabbing efficiency is dictated mainly by the user, the swab type and contact pressure.

Using this methodology, if the correct procedure is used, then any invisible bacteria have a great chance to be recovered and for pathogens such as *Listeria,* this is doubly important.