

Summaries

Campden BRI Group Report on: Preliminary testing of Freshcheck swab system

Work performed by Campden BRI (Chipping Campden) Limited

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1 SUMMARY

Preliminary colour change testing

A test matrix consisting of two soilant levels (0.3g/L and 3.0g/L bovine serum albumin, BSA), 3 inoculum levels (low ~102 CFU/25cm², medium ~104 CFU/cm² and high ~106 CFU/cm²) and 7 selected micro-organisms was constructed to assess the colour change on contaminated steel surfaces when using Freshcheck swabs with 3 different formulations and with traditional ATP testing for comparison. Hygiena Ultrasnap swabs were used to measure ATP present on inoculated areas alongside Freshcheck swabs. The manufacturer recommends that acceptance criteria are validated on a case-by-case basis. However, a generic pass criterion of <10 RLU (relative light units) is provided as guidance for food and beverage industry applications. Results showed a general trend of increasing RLU measurements with inoculum level, however in tests conducted with high BSA levels combined with medium inoculum levels (table 1) and low BSA levels combined with medium inoculum levels (table 3), the ATP levels measured indicated an acceptable level of contamination (<10 RLU on average) where enumeration of micro-organisms showed levels in excess of 103 CFU/25cm².

Results showed that the FC1 formulation was most consistent, showing a positive result of light green / khaki colour change when exposed to bacterial contamination, even at the lowest inoculum levels assessed (102 CFU/25cm²)

FC1 swabs were able to detect bacterial contamination in the presence of low to moderate levels of protein soil (0.3g/L BSA), representing residual protein remaining on surfaces after cleaning and disinfection. With high levels of protein soil (3.0g/L BSA) combined with dried-on inoculum inconsistent results were observed for FC1.

Under moist conditions (relatively low levels of liquid present - 0.1ml/25cm²), FC1 swabs consistently detected all levels of bacterial contamination assessed in the presence of both high and low levels of protein soil.

Results of this timed binary colour change test (time to achieve a positive result) showed that results should be achieved in under one minute. The time for each sample to turn light green ranged between 10 seconds and 40 seconds. The general trend showed that time to colour change was inversely proportional to inoculum level, but there was some variability and the difference in time to colour development between the highest and lowest inoculum levels was much lower for some organisms (e.g. Salmonella) than others.

At 107 CFU/swab, the average time taken for colour development was quite uniform between species, ranging from 13.33 seconds to 14.67 seconds across all micro-organisms tested.

At 101 CFU/swab, the average time taken to colour development showed a higher degree of variability, ranging from 15.67 seconds to 25.67 seconds across all micro-organisms tested

Report From “Top 3” Major UK Food Manufacture

Comparative Evaluation of FreshCheck Hygiene System Against Commercial ATP Systems in a Food Manufacturing Environment

1. Summary

The aim of the trial was to run a comparison study of the FreshCheck Hygiene Verification System (using a pre-production formulation of the FreshCheck swab) against the Merck MVP Icon ATP system. The goal was to compare sensitivity, time to result and to obtain an objective assessment of the FreshCheck mobile application for recording results and providing data analysis on the results. Conclusion

The results indicate that FreshCheck had a lower rate of false positives and false negatives compared to the MVP Icon system. The shorter time to results and the visual nature of the system was a strong advantage, as it was simpler to understand for the user and seeing the visual chemical reaction provided more trust in the product working correctly.

The use of the app also gained positive feedback, with users stating it was simple to navigate sample plans and test sites. A large piece of positive feedback was around the ability to take photos of the test site, as this added an extra layer of due diligence for the user, as it documented where the test was taken as well as the result. The one disadvantage seen was the need for the app to be online, though the FreshCheck team have already taken this into consideration and are making it fully functional in offline settings.

The overall conclusion of this 4-day trial was that the FreshCheck Hygiene Verification System offers strong advantages over current ATP systems, with a comparable, if not lower unit cost per test it is a strong commercially viable alternative to ATP in the food manufacturing industry.