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**Application Note**

# Evaluating Performance of MC Media Pad® Alternative Methods for Hygienic Indicators Enumeration in Food

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European Regulation and microbiological quality control plans include the requirement to perform analysis for assuring food safety and hygiene. Evaluation of reference and alternative methods for different food commodities including challenging food items is crucial to demonstrate fitness for purpose.

The purpose of this work was to compare MC Media Pad® with reference methods for aerobic enumeration, coliforms, *E. coli* and yeasts & molds, evaluating fitness for purpose in differentchallenging food items and categories.

MC Media Pad® is an alternative ready to use method consisting of non-woven fabric Pad coated with dehydrated culture media containing chromogenic substrates that allow colony differentiation and target identification in one single step.

## Materials and Methods

Four reference methods: Aerobic count (ISO 4833-1:2013); Coliform enumeration (ISO 4832:2006); *E. coli* enumeration (ISO 16649-2:2001) and Yeast and mould enumeration (ISO 21527-1&2:2008) and four MC Media Pad® alternative validated methods were tested for 135 different samples including challenging food items belonging to 8 food categories (meat, fish, bakery, dairy, fruits and vegetables, spices & seasoning, multicomponent foods and environmental samples).

Most samples contained natural microbial contamination but for *E. coli* and coliforms, artificial inoculation was performed using different stressed strains per food matrix.

Results were evaluated following relative trueness study design included in ISO 16140-2:2016. The same samples used in this study were tested to compare results obtained for Aerobic counts using MC Media Pad® at 30 ºC versus 37 ºC.


**Fig 1.** Preparation of the analysis and appearance of colonies in MC Media Pad®

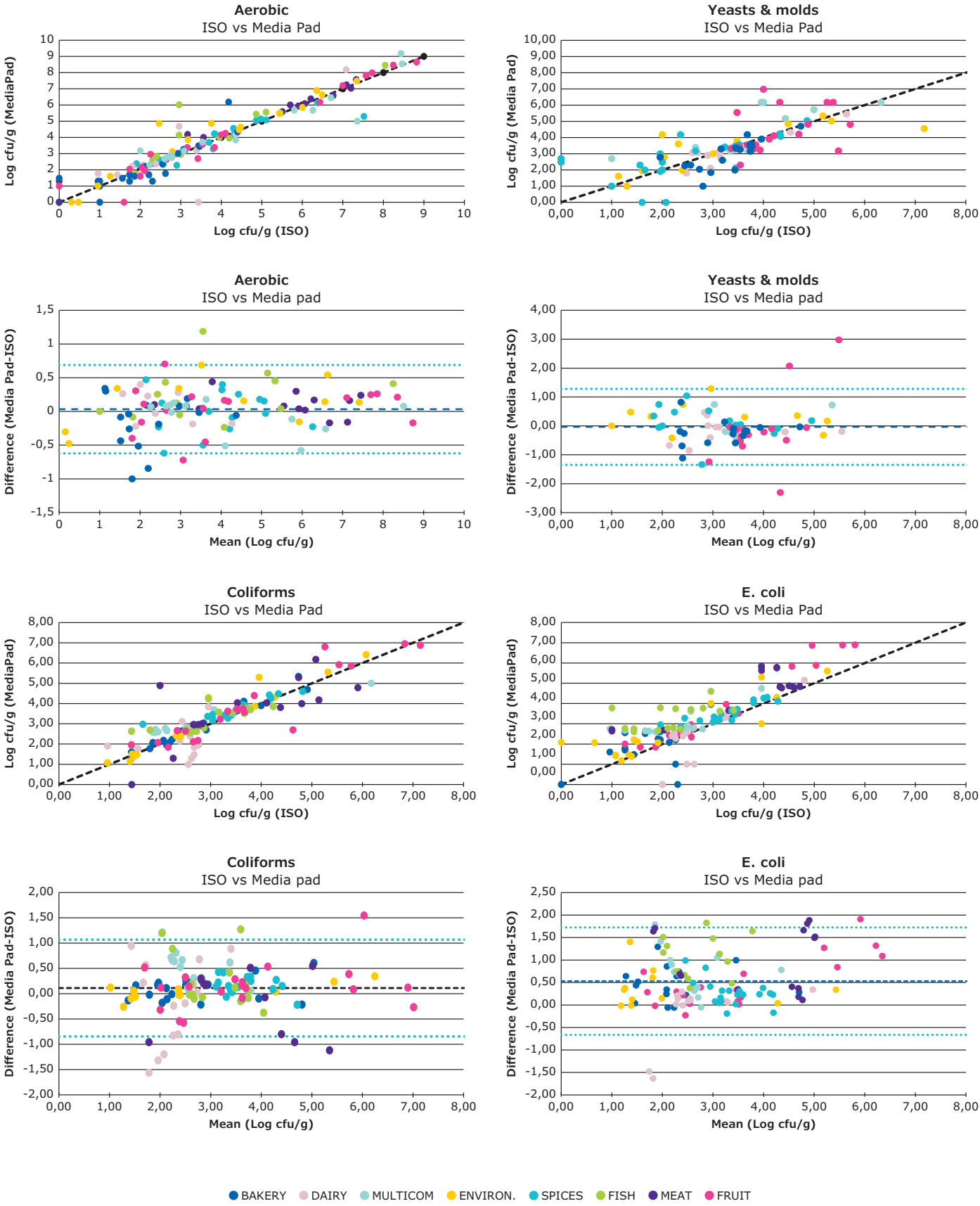


**Fig 2.** Scatter and Bland-Altman difference plots for all categories tested and for each of the microbial parameters studied, comparing MC Media Pad® versus ISO methods. The sign ( ) was used for results bellow or above the quantification limit of the methods.

## Results

Results for aerobic counts (n=135) yeast and molds (n= 105) and coliforms (n=135) provided equivalent results for all three methods tested, with non-significant bias. For *E. coli* (n=135), the recovery obtained in the ISO 16649-2:2001 in TBX agar (known to produce a low recovery of stressed cells) was consistently lower than for the Media Pad. Both alternative methods provided similar results and close to the spiked levels. Aerobic counts performed with MC Media Pad at 30 ºC (validated against ISO) and 37 ºC (validated against AOAC) in natural contaminated samples showed relevant differences.

## Conclusions

Evaluation of challenging food items from a broad range of food categories is crucial to confirm fitness for purpose of alternative and reference methods, allowing a better understanding of method performance and limitations.

MC Media Pad® have been proved a suitable method for a large variety of samples, even for food matrices containing characteristics such as colour, technological microbiota, high and low pH as well as high background microbiota that could affect the results.

The use of natural contaminated samples instead spiked samples for aerobic enumeration is crucial to compare methods and avoid bias associated to the use of specific strains able to growth and provide similar results in different conditions.

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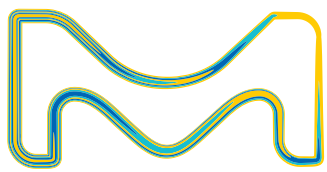



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