

Supplementary Material

Before adopting the MicroSnap™ System methodology, the authors checked the literature, peer-reviewed publications, and discussed with the manufacturer the different method validations available. In addition, the authors conducted a series of trials to verify the usefulness and accuracy of the methodology with an internal validation.

The following publications are available to support the use of the MicroSnap™ methodology as an alternative for indicator enumeration:

1. AOAC Validation of TVC method: In Meighan et al. 2016. In the Journal of AOAC International Vol. 99, no. 3, 2016 FOOD BIOLOGICAL CONTAMINANTS [The Validation of the MicroSnap Total for Enumeration of Total Viable Count in a Variety of Foods AOAC Performance Tested Method SM 031501](#). In this publication, the Total Viable Count methodology using MicroSnap™ was compared against a gold standard method ISO 4833 with direct plating.
2. AOAC Validation of Coliforms and E coli methods: In Meighan: Journal of AOAC International Vol. 97, no. 2, 2014 453 FOOD BIOLOGICAL CONTAMINANTS [Validation of the MicroSnap Coliform and E. coli Test System for Enumeration and Detection of Coliforms and E. coli in a Variety of Foods Performance Tested Method SM 071302](#). In this publication, the MicroSnap™ methodology was compared against a gold standard method AOAC Official Method 966.24 (1), and The U.S. Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM) Chapter 4 (2) reference methods for enumeration and detection of coliforms and E. coli in the claimed matrixes. The method was shown to have an acceptable correlation with Standard Methods for the Examination of Dairy Products (SMEDP) Chapter 7 (3).

For the [internal validation](#), four standard methodologies were compared against the MicroSnap™ system using chicken carcass rinse matrix as samples:

1. Direct plating using drop plating and microdilution on Tryptic Soy Agar plates (Millipore Sigma, Danvers, MA, USA).
2. MicroSnap™ system (Hygiena, Camarillo, CA, USA).
3. APC 3M™ Petrifilm™ (3M, Saint Paul, MN, USA) following the Association of Official Agricultural Chemists 990.12 (AOAC) official method.
4. TEMPO® System (BioMérieux, Paris, France) following the AOAC 121,204.

When statistical analysis was conducted using R, for the MicroSnap™ validation experiment counts were log10 transformed and then analyzed. A linear model was calculated, log10 counts from the MicroSnap™ system were considered an independent variable. Whereas log10 counts from direct plating, 3M™ Petrifilm™, and TEMPO® System were considered dependent variables.

The slope of the linear model (Figure S1) indicates the rate of change in microbial counts using the MicroSnap™ method due to an increment of 1 unit in the standard method. For the comparison to be valid, the slope should be close to 1, meaning that a 1 Log CFU/mL increase

using MicroSnap™ corresponds to a 1 Log CFU/mL increase using the standard method. Additionally, the intercept represents the value measured by the MicroSnap™ when the standard method (direct plating) yields a value of zero, reflecting the similarity between the two methods. The slope for the MicroSnap™ method (Table S1) was 1.117 with an adjusted r-square of 0.97 and a 95% confidence interval from 1.037 to 1.197. The intercept value was -0.411 with a 95% confidence interval from -0.813 to -0.008. The intercept was barely significant with a *p*-value equal to 0.046.

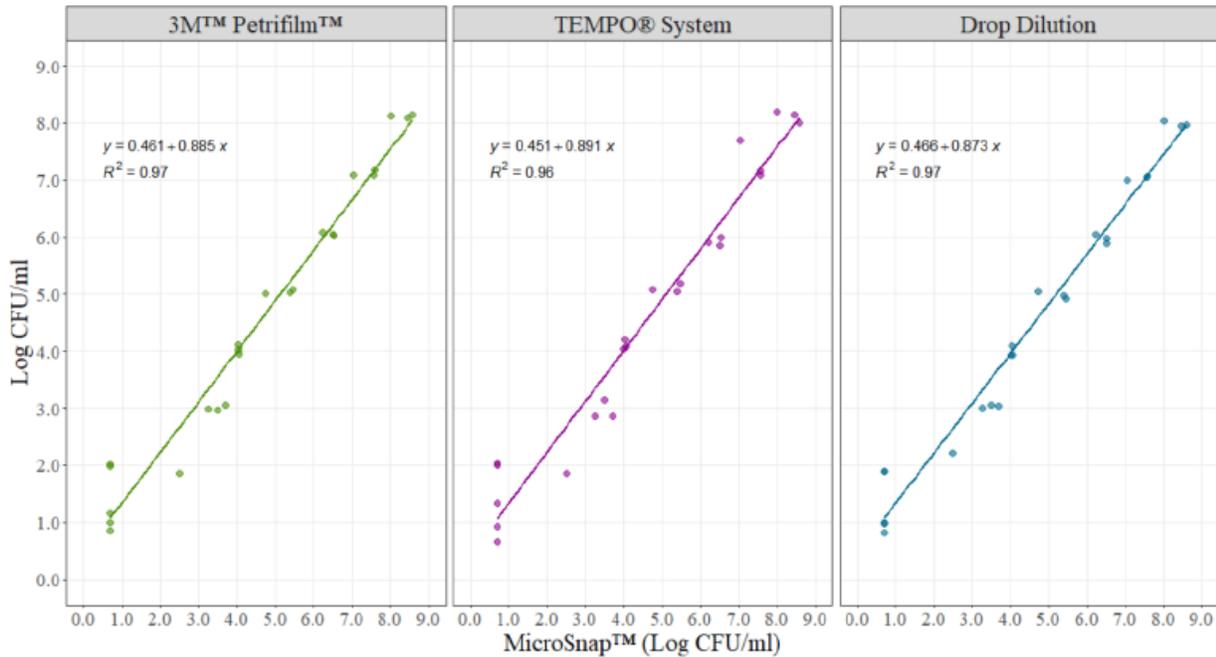


Figure S1. Linear relationship between bacterial counts in Drop Dilution, 3M™ Petrifilm™, and TEMPO® System, compared to MicroSnap™ (32= sampled per method, same samples were used to compare each method).

Table S1. Summary table of the linear model using the least square regression method predicting the bacterial counts on MicroSnap™ when compared with the standard method (direct plating).

Enumeration Method	Coefficient	Estimate	Standard Error	<i>p</i> -Value	95% Confidence Intervals	
					Lower (2.5%)	Upper (97.5%)
MicroSnap™	Intercept	-0.411	0.194	0.046	-0.813	-0.008
	Slope	1.117	0.038	< 0.001	1.037	1.197

With this information, the authors conclude that this methodology can be used and substitute other standard techniques while also providing the benefit of low cost and mobility for the type of research project described in this manuscript.

Since this is an important project with public health implications, in addition to the indicator's enumeration to evaluate the hygienic performance of the poultry processing operations in the

country, the authors evaluated *Salmonella* and *Campylobacter* detection and quantification utilizing a well-recognized methodology using RT-PCR which is the BAX System from Hygiena. Therefore, the use of the MicroSnap™ to measure bacterial indicators of hygiene, and the pathogen counts and prevalence using the PCR methodology provides a comprehensive evaluation of potential hazards in the poultry products of the country and the performance of the processing operations on bacterial and pathogen control.