

Assurance[®] GDS Manual PickPen[®] vs. PIPETMAX for Challenging Food and Environmental Samples

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Introduction

The BioControl[®] Assurance[®] GDS system is widely accepted for the detection of food pathogens. The proprietary Assurance[®] GDS PickPen[®] II device has been shown to be a very powerful tool for immunomagnetic separation (IMS) of pathogenic organisms from an entire range of food matrices. Preparation of samples for analysis by Assurance[®] GDS methods involves sample enrichment, reagent dispensing, IMS using the proprietary PickPen[®] device, and sample transfer steps.

The Assurance[®] GDS PickPen[®] PIPETMAX (PPMX) has been customized to be an automated alternative to manual GDS analysis. Automation by the PPMX offers reduced hands-on technician time, improved sample to sample consistency, along with overall ease of sample preparation.

Objective

We used both the manual PickPen[™] and automated PPMX methods to demonstrate sample preparation equivalence in challenging food matrices. To compare the equivalence of sample preparation for Assurance[®] GDS analysis performed manually using the PickPen[™] device with the automated manner utilizing the Assurance[®] GDS PPMX instrument equipped with an automated PickPen[™] head in a variety of challenging foods by multiple Assurance[®] GDS methods.

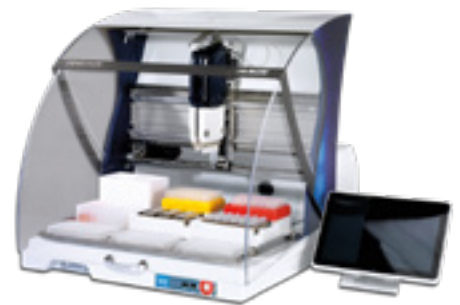
Methods

Sample Workflow:



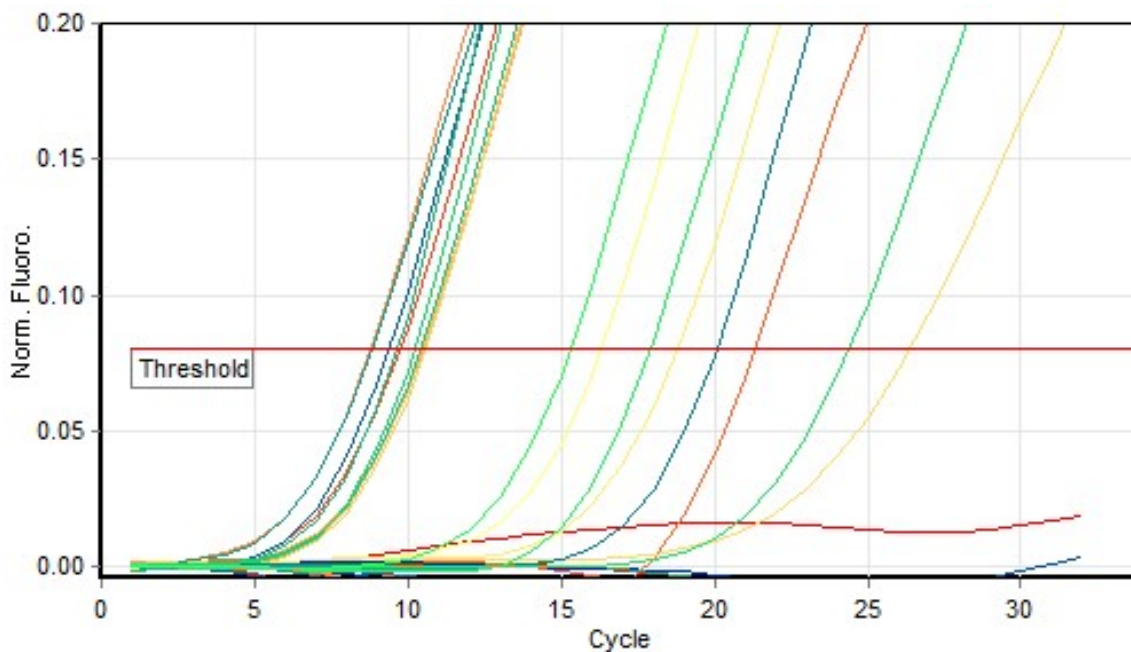
Results

274 of 375 samples were confirmed positive with both the PickPen® and PipetMax. 101 samples were negative on both setups with no discrepant results. The mean Ct values across all the positive curves were within 0.3 of each other. Four different Assurance® GDS kits were evaluated with 5 different foods and 3 environmental surfaces. The food matrices were chosen due to either a high volume of particulates, inhibitory ingredients or high microbial load.



Example Run File:

Salmonella



No	Salmonella	Salmonella Result	Salmonella Ct	Assay	Kit Lot Number	Description
1	Negative	-		Salmonella	current	manual
2	Negative	-		Salmonella	current	manual
3	Negative	-		Salmonella	current	manual
4	Negative	-		Salmonella	current	manual
5	Positive	+	9.76	Salmonella	current	manual
6	Negative	-		Salmonella	current	manual
7	Positive	+	21.33	Salmonella	current	manual
8	Negative	-		Salmonella	current	manual
9	Positive	+	8.81	Salmonella	current	manual
10	Negative	-		Salmonella	current	manual
11	Positive	+	10.50	Salmonella	current	manual
12	Positive	+	10.48	Salmonella	current	manual
13	Positive	+	10.57	Salmonella	current	manual
14	Positive	+	26.37	Salmonella	current	manual
15	Positive	+	18.81	Salmonella	current	manual
16	Positive	+	16.33	Salmonella	current	manual
17	Negative	-		Salmonella	current	PPMX
18	Negative	-		Salmonella	current	PPMX
19	Negative	-		Salmonella	current	PPMX
20	Negative	-		Salmonella	current	PPMX
21	Positive	+	9.40	Salmonella	current	PPMX
22	Negative	-		Salmonella	current	PPMX
23	Positive	+	20.08	Salmonella	current	PPMX
24	Negative	-		Salmonella	current	PPMX
25	Positive	+	8.85	Salmonella	current	PPMX
26	Negative	-		Salmonella	current	PPMX
27	Positive	+	9.67	Salmonella	current	PPMX
28	Positive	+	10.42	Salmonella	current	PPMX
29	Positive	+	10.22	Salmonella	current	PPMX
30	Positive	+	24.38	Salmonella	current	PPMX
31	Positive	+	17.90	Salmonella	current	PPMX
32	Positive	+	15.32	Salmonella	current	PPMX

Results (cont.)

Table 1: Manual versus PPMX Sample Processing

GDS Assay	Food Type	No. of Samples	No. of Positives	No. of FP	No. of FN	Mean Delta Ct
Salmonella	Cocoa Mass	19	10	0	0	-1.5
Salmonella	Cumin	22	15	0	0	-0.9
Salmonella	Raw Milk	96	85	0	0	-1.1
Salmonella	Plastic	30	7	0	0	0.5
Salmonella	Poultry Rinse	24	19	0	0	-0.5
Salmonella	Boot Swabs	20	19	0	0	0.1
Salmonella	Raw Cheese	16	7	0	0	-0.4
Listeria spp.	Plastic	16	10	0	0	0.5
Cronobacter	Infant Cereal	20	9	0	0	-1.0
MPX Top 7 STEC	Raw Milk	96	81	0	0	0.4
MPX Top 7 STEC	Raw Cheese	16	12	0	0	0.3
4	8	375	274	0	0	-0.3

Conclusion

This validation study demonstrated the equivalence of the PickPen® and PipetMax for the sample preparation of difficult food matrices and environmental surfaces. Both sample preparations are suitable for the Assurance® GDS Pathogen Detection System.

Contact Information

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Please visit:
SigmaAldrich.com/GDS

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