



# Enhancing Efficiency in Microbiological Quality Control: Time Savings with Pre-enumerated Positive Controls in the Soleris NG System

Kali Sorum RM(NRCM) [Microbiologics], Amanda Marshall [Neogen], Asha Singh[Neogen]

## INTRODUCTION

Microbiological quality control (QC) is a critical step in the production and release of food, pharmaceutical, and cosmetic products. Traditional microbiological methods, such as culture-based plate counting, require multiple manual steps and extended incubation periods, often between 3 to 5 days or more. These limitations can delay product release, increase storage costs, and introduce risk of product spoilage or waste. As industries increasingly demand faster, more reliable testing methods to support just-in-time manufacturing and tighter regulatory compliance, there is a growing need for streamlined microbiological solutions that deliver rapid, actionable results without sacrificing accuracy.

The Soleris® Next Generation (NG) system by NEOGEN is an automated optical detection platform designed to significantly reduce the time required to detect microbial contamination. Capable of detecting a wide range of organisms, including *E. coli*, *S. aureus*, *Salmonella spp.*, and *Pseudomonas aeruginosa*, Soleris® NG uses pre-filled vials with selective media to detect metabolic changes that indicate microbial growth. This system allows for continuous, non-destructive monitoring with minimal hands-on time and results available in as little as 2 hours, depending on the organism and test type. Additionally, its real-time data output allows for earlier detection and decision-making compared to endpoint-based traditional methods.

To fully leverage the Soleris® NG system's speed and automation, pre-enumerated positive controls like Microbiologics' EZ-Accu Shot™ are employed to verify performance and ensure system integrity. These ready-to-use lyophilized pellets eliminate the need for colony counting, dilution series, and in-house enumeration, reducing QC preparation time from several hours to just minutes. In this study, we evaluated the performance of the Soleris® NG System when used with EZ-Accu Shot™ controls across a variety of microbial targets. Our goal was to assess the combined impact on detection speed, workflow efficiency, labor savings, and overall ease of use in a QC environment.

## METHODS

Microbiologics EZ-Accu Shot™ lyophilized pellets were rehydrated according to manufacturer instructions and used as positive controls for the Soleris® NG test vials types indicated in Table 1.

For USP <61> testing, 0.1 mL of the rehydrated pellet suspension material was inoculated into the appropriate Soleris® NG vial type listed in Table 1. Incubation conditions are listed in Table 2. A non-selective agar plate was plated in parallel for each organism/vial combination. TSA plates were incubated at 35°C for 2 to 3 days, SDA+C plates were incubated at 25°C for ≤5-7 days.

For presence/absence testing per USP <62>, 0.1 mL of the rehydrated pellet suspension was added to 90 mL TSB for enrichment at 30-35°C for 18-24 hours. From the enriched cultures, 0.1 mL was transferred to the appropriate Soleris® NG vial type listed in Table 1. As a control, the traditional media plates listed in Table 1 were inoculated in parallel. TSA plates were incubated at 35°C for 2 to 3 days, SDA+C plates were incubated at 25°C for ≤5-7 days, EMB/VRBGA/VRBA/BPA/XLD/CET plates were incubated at 35°C for 24 to 48 hours.

Organism (Strain)	Catalog Number	Soleris Vial Type	Traditional Media
<i>Escherichia coli</i> (ATCC 8739)	0483A	CC-109, S2-EC, S2-EBAC9	TSA, EMB, VRBGA, VRBA
<i>Staphylococcus aureus</i> (ATCC 6538)	0485A	NF-TVC, S2-SA, S2-EBAC9, S2-EC, DYM-109C	TSA, MSA, VRBGA, VRBA, SDA+C
<i>Pseudomonas aeruginosa</i> (ATCC 9027)	0484A	NF-TVC, S2-GN, PD, 109	TSA, VRBGA, CET
<i>Bacillus spizizenii</i> (ATCC 6633)	0486A	NF-TVC, CC-109, S2-GN	TSA, VRBA, VRBGA
<i>Candida albicans</i> (ATCC 10231)	0443A	DYM-109C	SDA
<i>Aspergillus brasiliensis</i> (ATCC 16404)	0392A	DYM-109C	SDA
<i>Salmonella Typhimurium</i> (ATCC 13311)	0421A	S2-SAL	XLD
<i>Salmonella Typhimurium</i> (ATCC 14028)	0363A	S2-SAL	XLD

\*\*Tests where the strain swas used as the inhibitory control are bolded and highlighted purple

Soleris Vial Type (Catalog #)	Threshold	Skip	Shuteye	Max Duration (hours)	Temperature
Total Aerobic Count (NF-TVC)	10	1	30	24	35°C
Yeast & Mold (DYM-109C)	8	2	50	48	35°C
Coliform (CC-109)	10	1	25	18	35°C
Enterobacteriaceae (S2-EBAC9)	10	1	25	18	35°C
<i>E. coli</i> (S2-EC)	8	2	20	24	35°C
<i>Salmonella</i> (S2-SAL)	8	1	25	20	35°C
<i>Staphylococcus</i> (S2-SA)	15	1	30	22	35°C
<i>Pseudomonas</i> (PD-109)	10	1	35	20	35°C
Gram Negative (S2-GN)	10	1	30*	48	35°C

## RESULTS

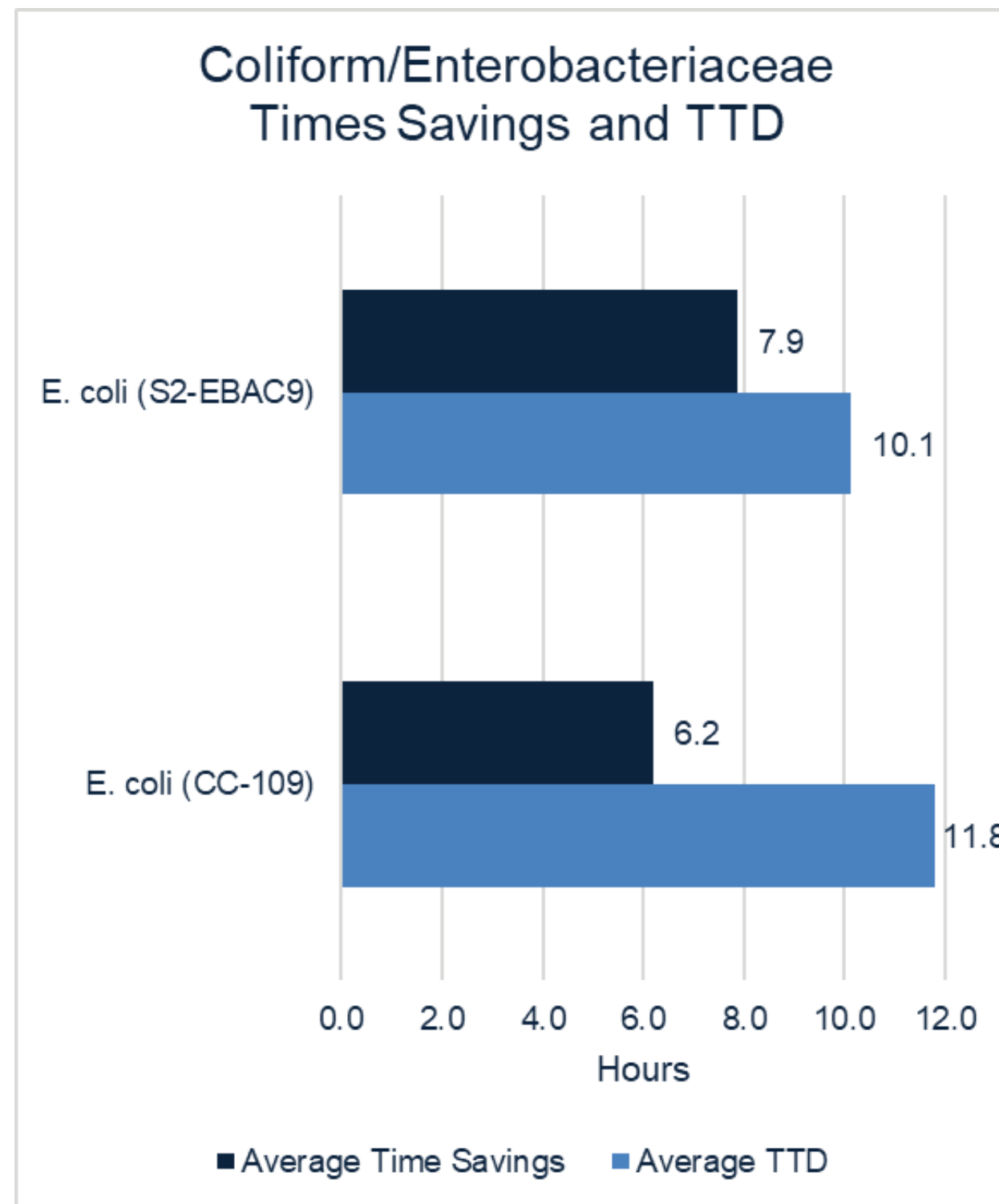


Figure 1. Time To Detection (TTD) in hours compared to time savings in hours for traditional Coliform and Enterobacteriaceae testing. Traditional methods require results to be observed within 18 hours. Traditional plate counts were performed on TSA and an average of 38 CFU/0.1 mL was obtained

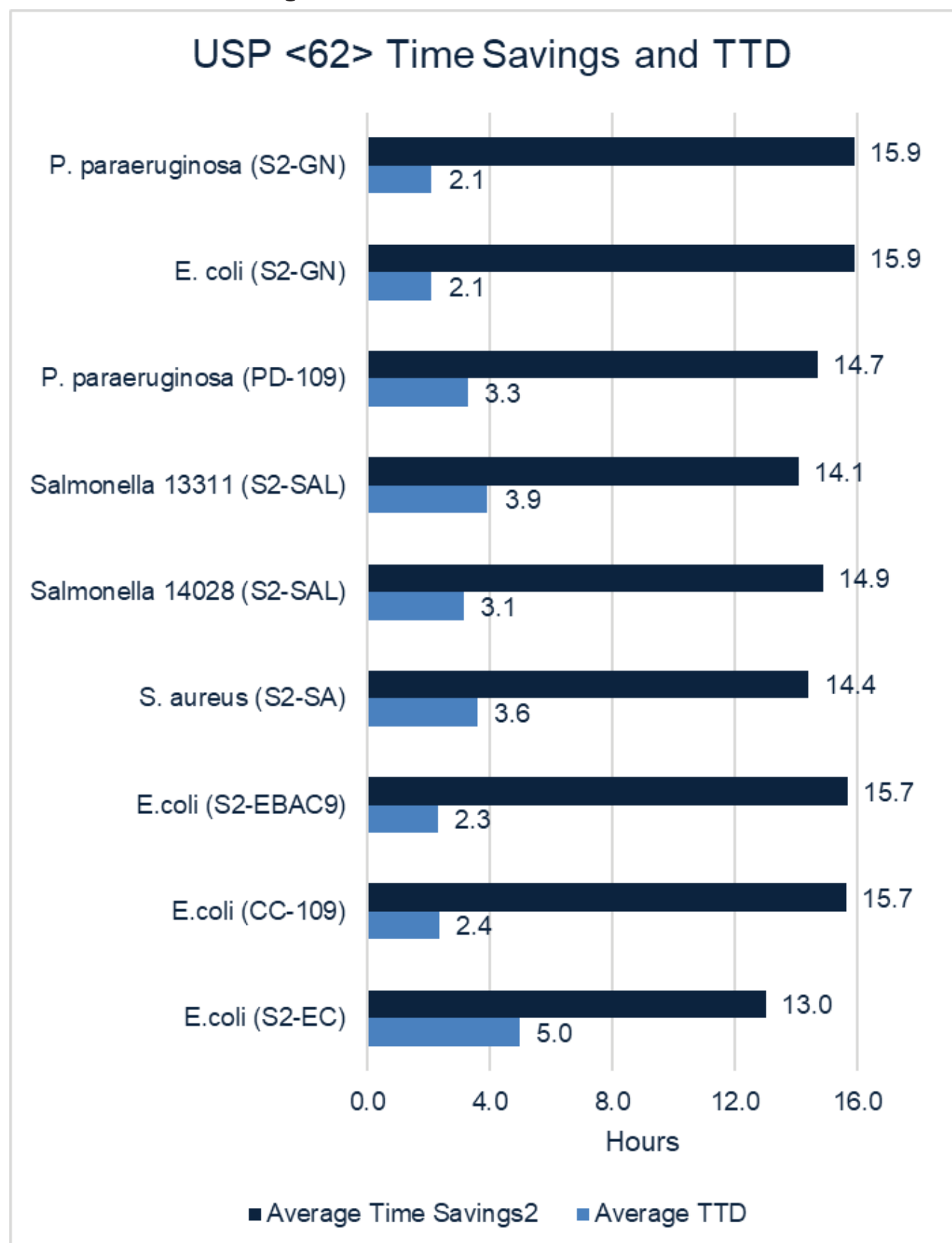


Figure 2. Time savings in hours for USP <62> Specified Organism tests. Traditional methods require detection within 18 hours. Viability Plate counts on TSA averaged 43 CFU/0.1 mL. Traditional plates were expected to exhibit growth. Growth was obtained on EMB/VRBGA/VRBA/BPA/XLD/CET plates.

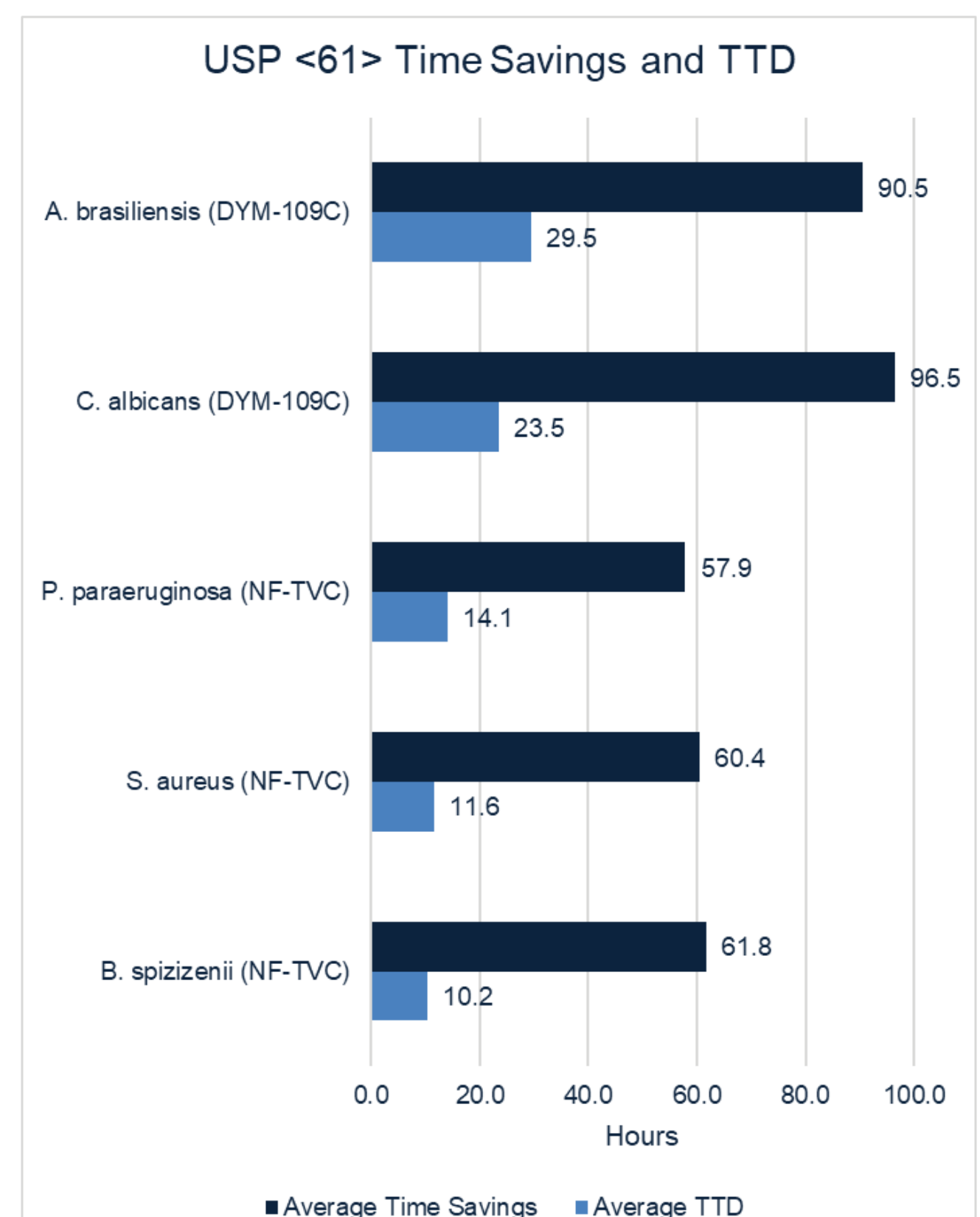
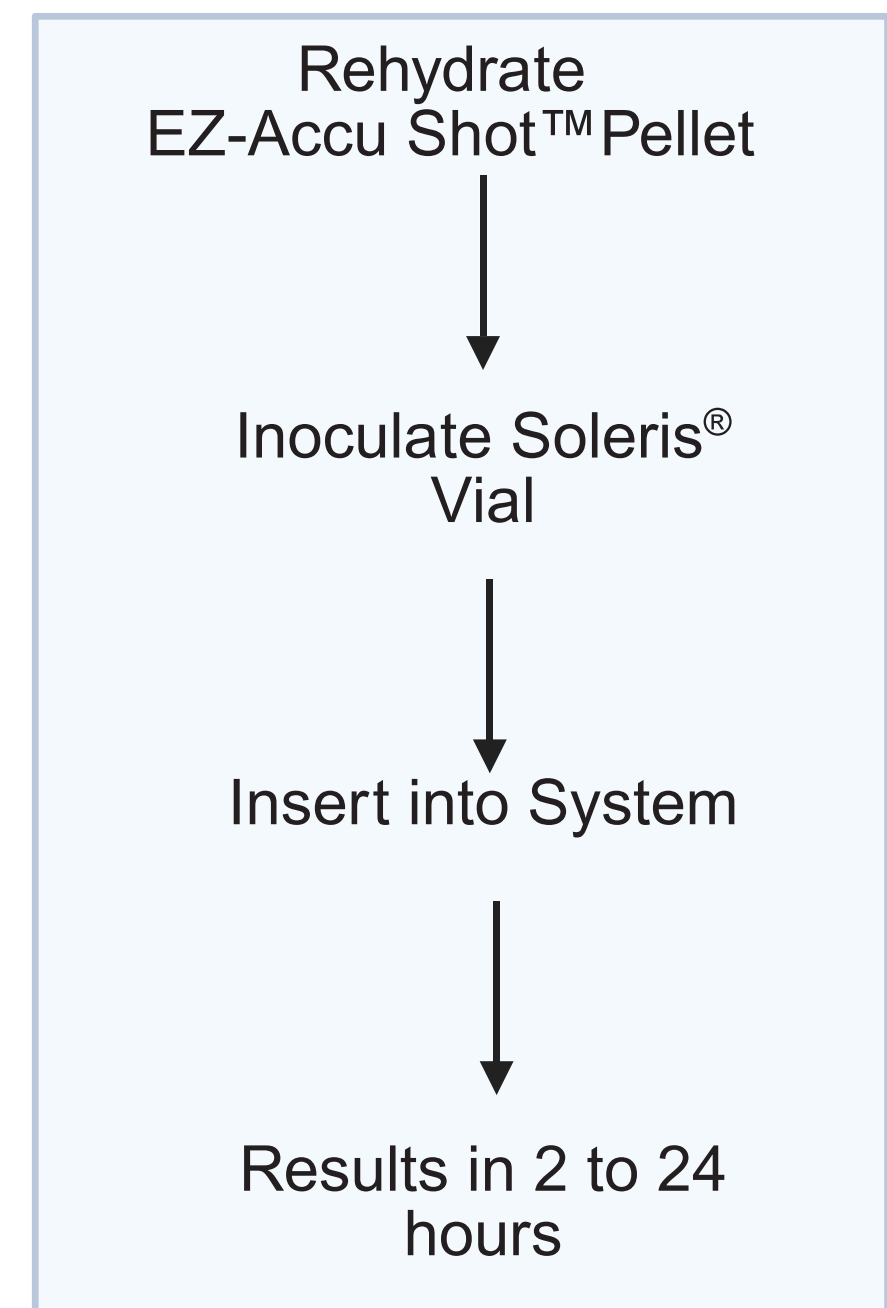


Figure 3. Time savings in hours for USP <61> Microbial Enumeration tests. Traditional methods require detection within 72 hours or aerobic microorganisms and 120 hours for yeasts and molds (Y&M). Traditional Plate counts on TSA averaged 46 CFU/0.1 mL, counts on SDA+C averaged 24 CFU/0.1 mL.

## WORKFLOW

### Streamlined QC With EZ-Accu Shot™ and Soleris® NG System



## CONCLUSION

The Soleris® NG System, combined with EZ-Accu Shot™ positive controls, delivers accurate microbial detection in dramatically less time than traditional methods. Detection was obtained well below the expected time frames for traditional plate methods, and well below the maximum incubation time for USP <61> and USP <62> Growth Promotion testing standards. On average, results for USP <61> were obtained 60 hours sooner for aerobic organisms and 93.5 hours sooner for Y&M organisms than traditional incubation expectations. On average, results for USP <62> testing were obtained 15 hours sooner than traditional incubation expectations.

EZ-Accu Shot™ controls further streamlined the workflow by:

- Reducing setup time to under 15 minutes
- Ensuring accuracy and reproducibility
- Providing multiple organisms from a single, easy-to-use kit

This integration results in faster product release, extended shelf-life, reduced waste, and lower labor costs, making it ideal for modern QC laboratories.

## ACKNOWLEDGEMENTS

We gratefully acknowledge Neogen for conducting the internal testing of EZ-Accu Shot™ positive controls on the Soleris® NG System and for providing a comprehensive and well-documented data set. Their collaboration and technical expertise were instrumental in supporting the study and ensuring the reliability and depth of the findings presented in this poster.

