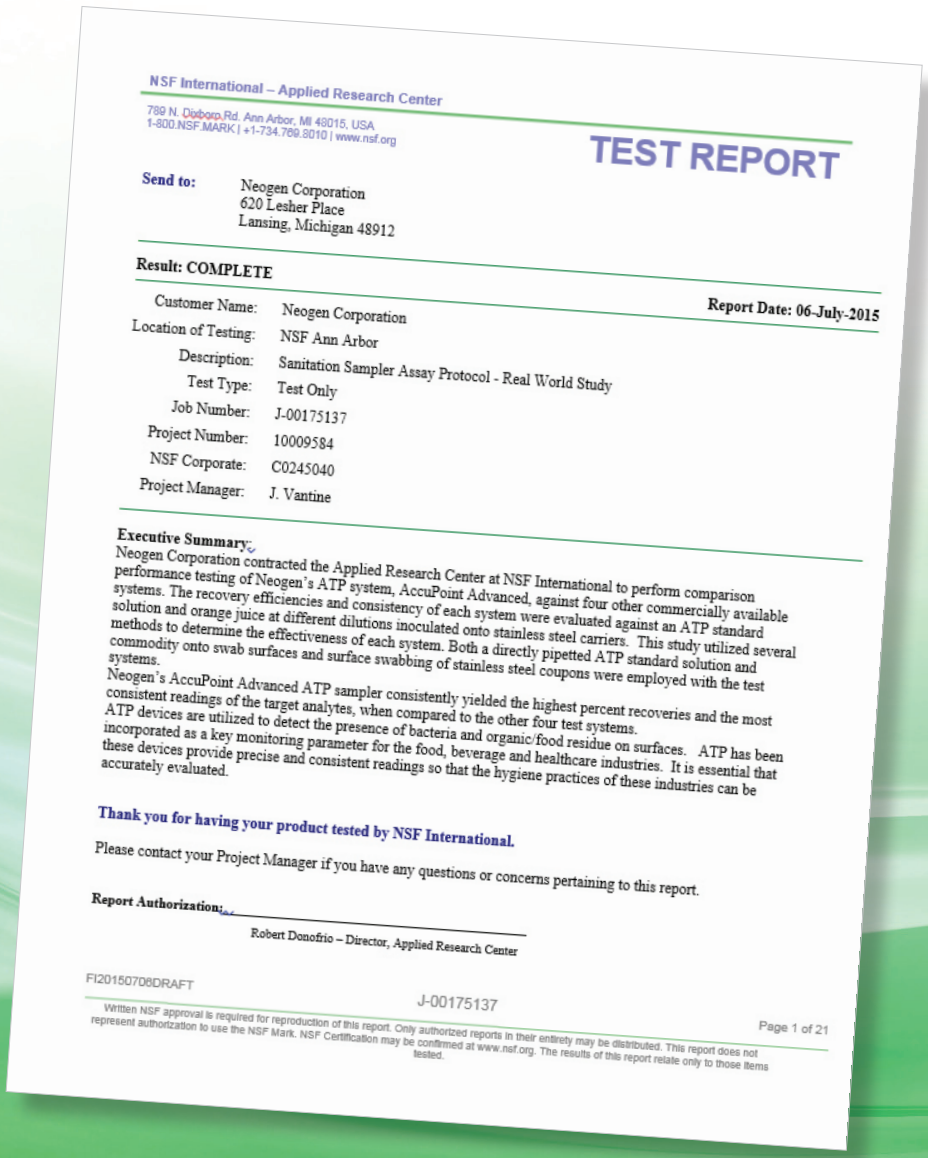


NSF International – Applied Research Center

789 N. Dixboro Rd. Ann Arbor, MI 48105, USA
1-800.NSF.MARK | +1-734.769.8010 | www.nsf.org

TEST REPORT

Send to: Neogen Corporation
620 Lesher Place
Lansing, Michigan 48912

Result: COMPLETE

Report Date: 06-July-2015

Customer Name:	Neogen Corporation
Location of Testing:	NSF Ann Arbor
Description:	Sanitation Sampler Assay Protocol - Real World Study
Test Type:	Test Only
Job Number:	J-00175137
Project Number:	10009584
NSF Corporate:	C0245040
Project Manager:	J. Vantine

Executive Summary:

Neogen Corporation contracted the Applied Research Center at NSF International to perform comparison performance testing of Neogen's ATP system, AccuPoint Advanced, against four other commercially available systems. The recovery efficiencies and consistency of each system were evaluated against an ATP standard solution and orange juice at different dilutions inoculated onto stainless steel carriers. This study utilized several methods to determine the effectiveness of each system. Both a directly pipetted ATP standard solution and commodity onto swab surfaces and surface swabbing of stainless steel coupons were employed with the test systems.

Neogen's AccuPoint Advanced ATP sampler consistently yielded the highest percent recoveries and the most consistent readings of the target analytes, when compared to the other four test systems.

ATP devices are utilized to detect the presence of bacteria and organic/food residue on surfaces. ATP has been incorporated as a key monitoring parameter for the food, beverage and healthcare industries. It is essential that these devices provide precise and consistent readings so that the hygiene practices of these industries can be accurately evaluated.

Thank you for having your product tested by NSF International.

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

Report Authorization:

Robert Donofrio – Director, Applied Research Center

FI20150706DRAFT

J-00175137

Page 1 of 21

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NSF International Study

A comparison of commercial ATP hygiene monitoring systems under real-world conditions

NEOGEN®

How **accurately** and **consistently** does each system report the amount of homogenously distributed ATP on a 4”X4” stainless steel surface?



Recovery of ATP from a stainless steel surface

Best:

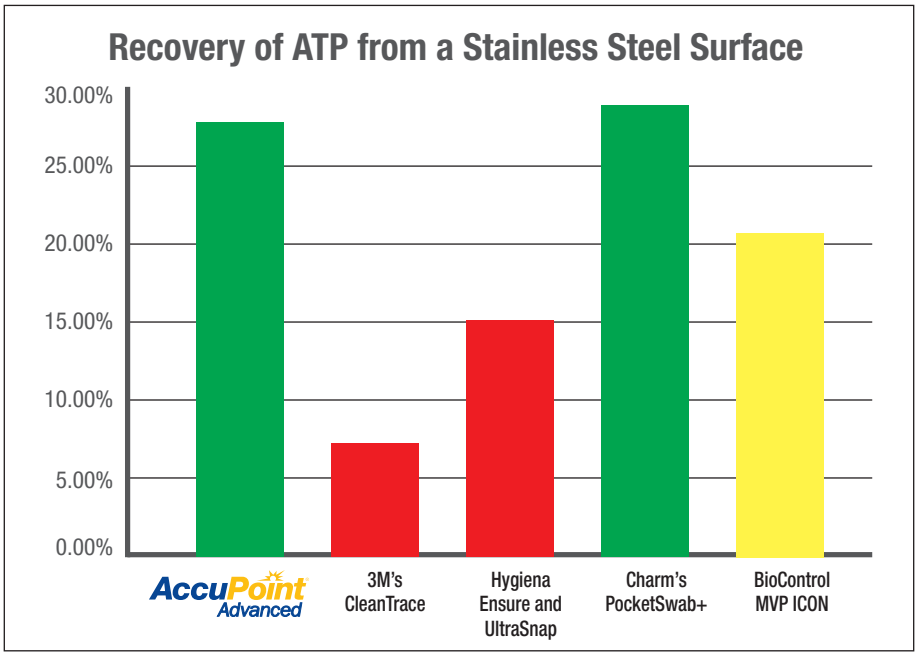
1. Charm PocketSwab+ – 28.9%
2. **AccuPoint® Advanced** – 27.8%

Good:

3. BioControl MVP ICON – 20.8%

Poor:

4. Hygiena Ensure – 15.1%
5. 3M CleanTrace – 7.2%



Coefficient of variation or consistency of scores

Best:

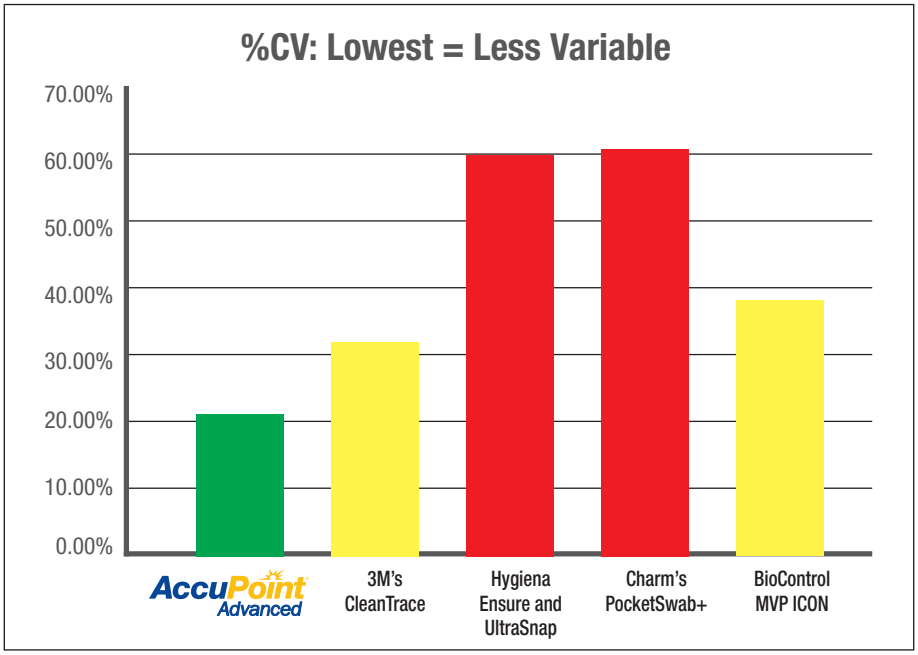
1. **AccuPoint Advanced** – 21.1%

Good:

2. 3M CleanTrace – 31.9%
3. BioControl MVP ICON – 38.3%

Poor:

4. Hygiena Ensure – 59.9%
5. Charm PocketSwab+ – 60.8%



Best **Good** **Poor**

How **accurately** and **consistently** does each system find a randomly placed dot of ATP on a 4”X4” stainless steel surface?



In the real world, dirt is NOT homogenously distributed on surfaces after cleaning. Dirt is invisible and randomly distributed in small spots on surfaces. Will the ATP system find it?

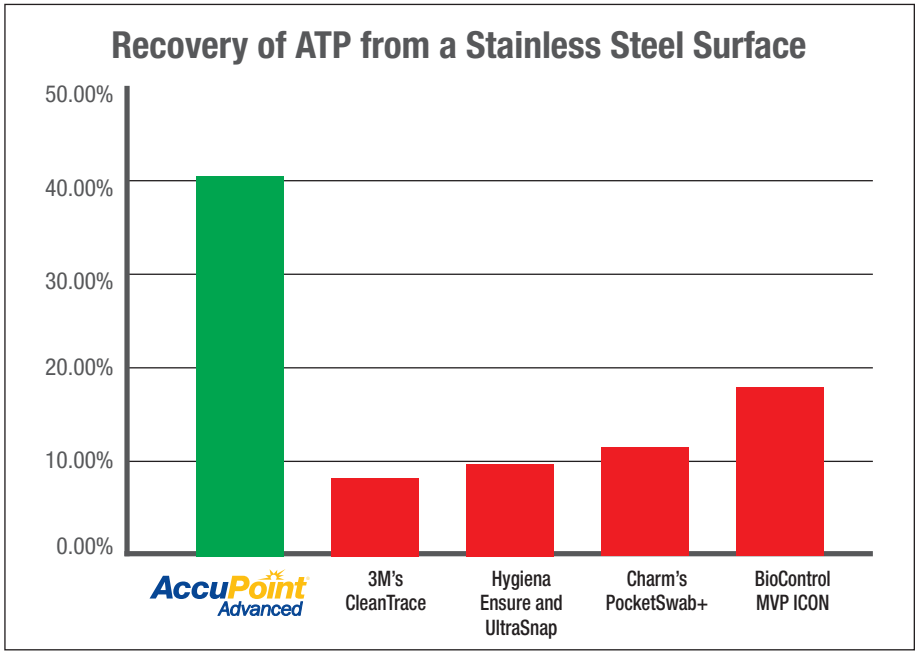
Recovery of ATP from a stainless steel surface

Best:

1. **AccuPoint Advanced** – 40.5%

Poor:

2. BioControl MVP ICON – 17.9%
3. Charm PocketSwab+ – 11.5%
4. Hygiena Ensure – 9.7%
5. 3M CleanTrace – 8.2%



Coefficient of variation or consistency of scores

Best:

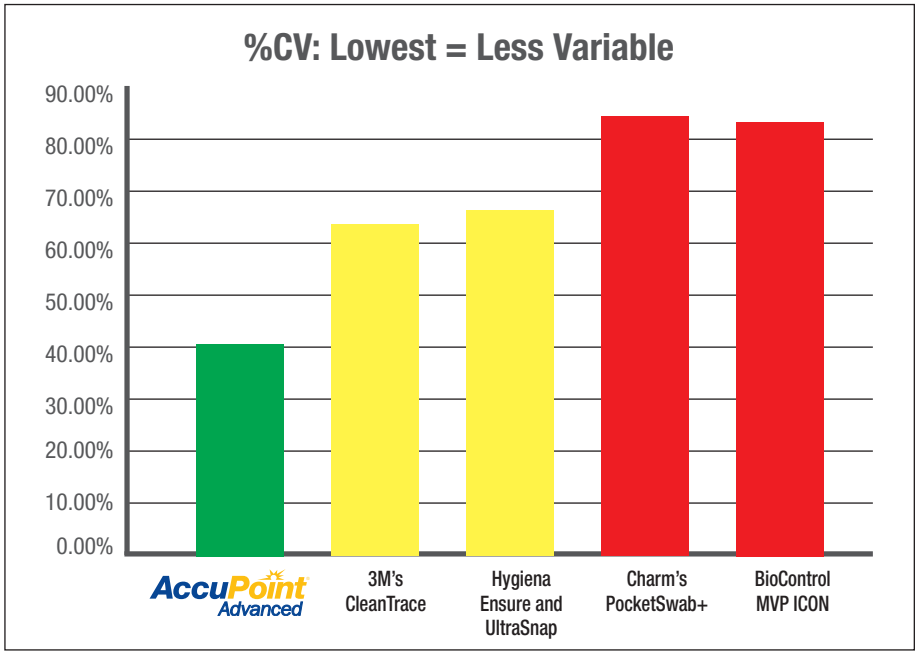
1. **AccuPoint Advanced** – 40.6%

Good:

2. 3M CleanTrace – 63.6%
3. Hygiena Ensure – 66.3%

Poor:

4. BioControl MVP ICON – 83.3%
5. Charm PocketSwab+ – 84.4%



“The Neogen AccuPoint Advanced system exhibited a percent ATP recovery that was 2X’s greater than the next most efficient monitoring system.”

How **accurately** and **consistently** does each system report the presence of a commodity, orange juice, on a 4”X4” stainless steel surface?



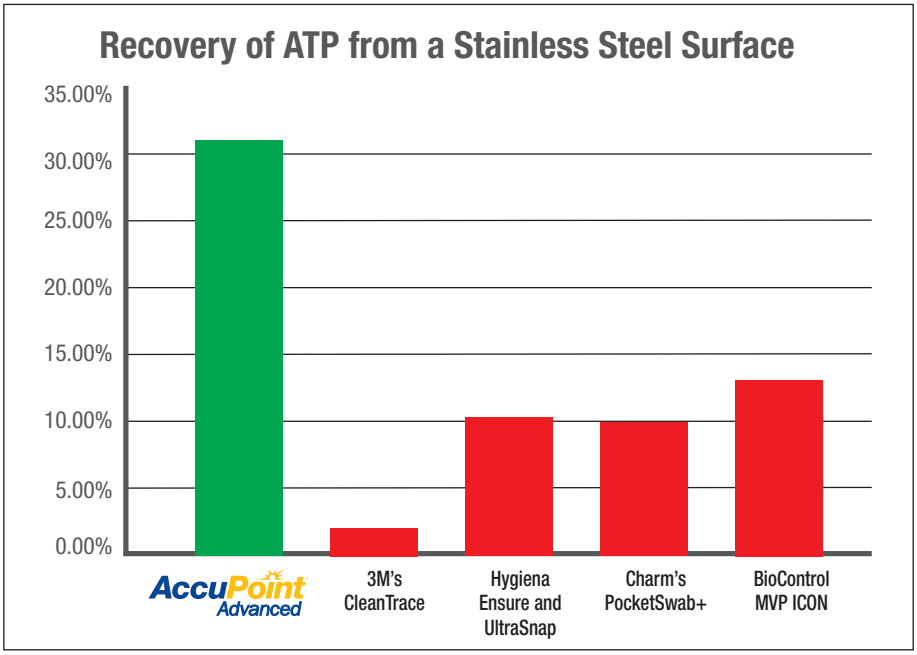
Recovery of ATP from a stainless steel surface

Best:

1. **AccuPoint Advanced** – 31.0%

Poor:

2. BioControl MVP ICON – 13.1%
3. Hygiena Ensure – 10.3%
4. Charm PocketSwab+ – 9.9%
5. 3M CleanTrace – 2.0%



Coefficient of variation or consistency of scores

Best:

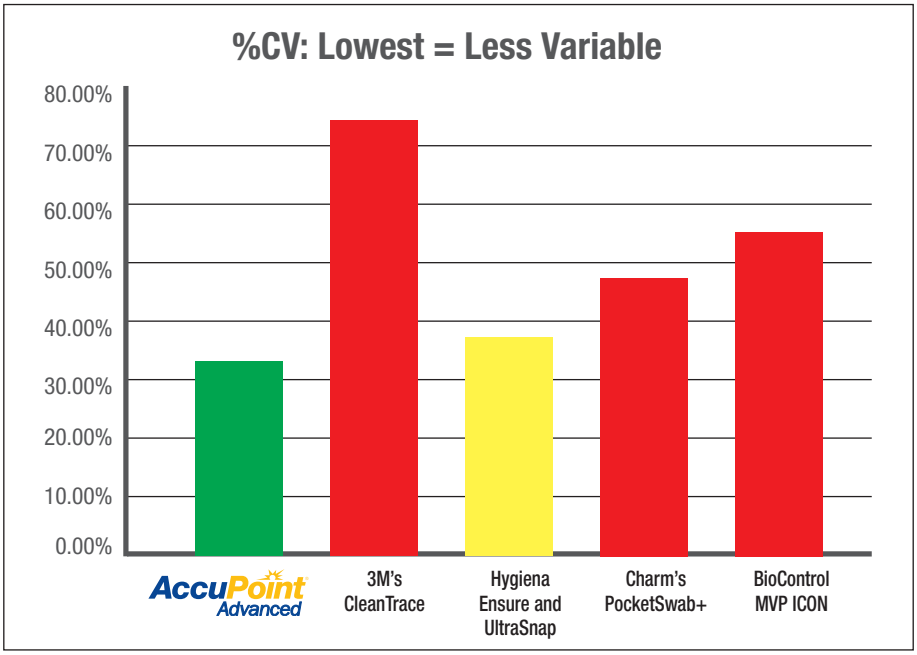
1. **AccuPoint Advanced** – 33.1%

Good:

2. Hygiena Ensure – 37.2%

Poor:

3. BioControl MVP ICON – 55.3%
4. Charm PocketSwab+ – 47.6%
5. 3M CleanTrace – 74.3%



NSF International – The Public Health and Safety Organization

NSF International, headquartered in Ann Arbor, Michigan, is an independent global organization that writes public health standards, and tests and certifies products for the food, water, health science, dietary supplements and consumer goods industries.

NSF International performed a real-world study comparing the accuracy and consistency of the top five ATP hygiene monitoring systems. Those systems included:



The focus of the study was to evaluate the systems under real-world conditions. In the real world, these systems:

- Are used to sample surfaces. Direct pipetting of samples onto swab tips, the protocol for some previous ATP system comparison studies, misrepresents the true application for and performance of these systems.
- Perform testing on production equipment, typically composed of stainless steel.
- Perform testing on a production floor, not in a commercial laboratory.
- Perform testing within a narrow window of time between production runs.

Executive summary:

"Neogen's AccuPoint Advanced ATP system consistently yielded the highest percent recoveries and the most consistent readings of the target analytes, when compared to the other four test systems."

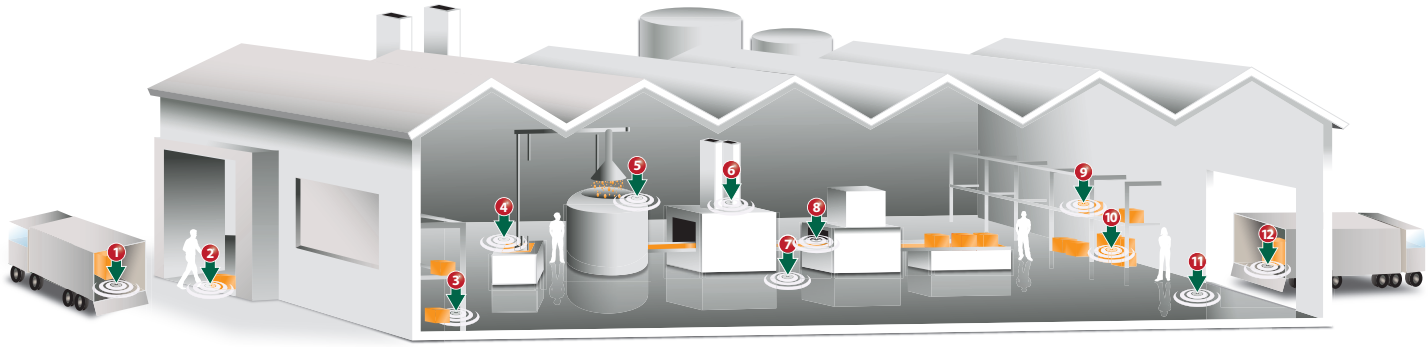
"ATP devices are utilized to detect the presence of bacteria and organic / food residues on surfaces. ATP has been incorporated as a key monitoring parameter for the food, beverage and healthcare industries. It is essential that these devices provide precise and consistent readings so that the hygiene practices of these industries can be accurately evaluated."

Accuracy – represented by % recovery of ATP from the sampled surface. How much of the organic material from the surface does the system actually detect? Higher recovery = truer representation of surface cleanliness.

Consistency – represented by coefficient of variation (%CV). Represents the range of score values. Lower = **less variation** = **more consistent**. Example: With a mean of 300 and a 20%CV, expected scores would range from 240 – 360. With a mean of 300 and a 50%CV, expected scores would range from 150 – 450.



Versatility of ATP Hygiene Monitoring in Your Facility



Incoming Goods and Warehouse

1. **AUDITING SUPPLY CHAIN**
   Use Neogen to verify allergen controls
2. **INCOMING GOODS**
   Use Neogen to confirm supplier specifications
3. **WAREHOUSE**
   Use Neogen to ensure robust ingredient segregation and packaging integrity

Processing and Packaging

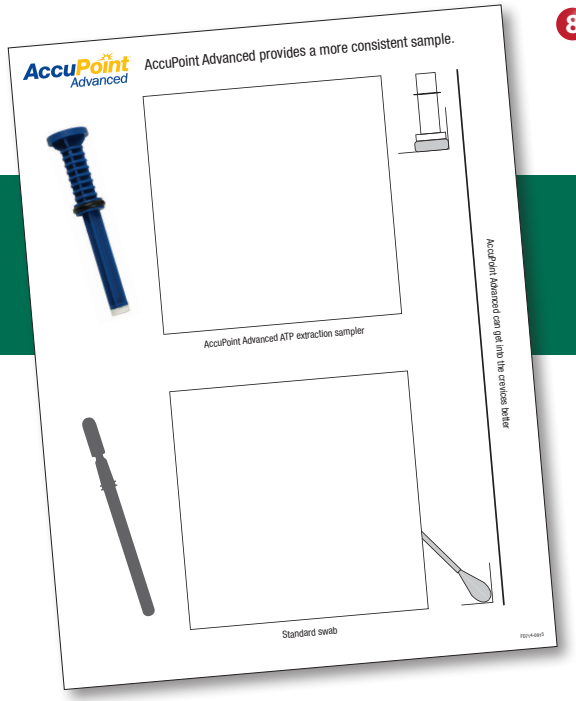
4. **FOOD PREPARATION SURFACE**
   Use Neogen to validate cleaning and detect cross-contamination

5 6. **PROCESS EQUIPMENT AND UTENSILS**
   Use Neogen to validate cleaning and detect cross-contamination

7. **SPILLAGES**
   Use Neogen to ensure verification of cleaning
8. **IN-PROCESS AND RE-WORK**
   Use Neogen to detect potential cross-contamination

Finished Product and Warehouse

9. **FINISHED PRODUCT**
   Use Neogen to verify product labelling claims
10. **WAREHOUSE**
    Use Neogen to ensure robust final product segregation and packaging integrity
11. **SPILLAGES**
    Use Neogen to ensure verification of cleaning
12. **FINISHED PRODUCT SUPPLY CHAIN**
    Use Neogen for auditing and enforcement



See for yourself why the AccuPoint Advanced system is the most accurate and precise. Contact Neogen for more information.

Disclaimer: The information contained in this document is based solely on data generated in a study by NSF International and has not been modified in any way.

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800-234-5333 (USA/Canada) • 517-372-9200
foodsafety@neogen.com • www.neogen.com

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FD678-0715