

## Faster *S. aureus* Result Promotes Better Inventory Management

Food processors may now obtain earlier indication of product quality and sanitation effectiveness with the newly introduced 3M<sup>™</sup> Petrifilm<sup>™</sup> Rapid *S. aureus* Count (RSA) Plate. *Staphylococcus aureus* results are available in as little as 26 hours, compared to the 69 hours required for conventional testing.

"Petrifilm Rapid *S. aureus* Count plates offer rapid, comprehensive and cost-effective *S. aureus* results with an excellent correlation to the current Baird-Parker agar and tube coagulase method," said Kevin Habas, market development supervisor, 3M Microbiology Products. "They provide an added value solution to problems associated with testing and extra costs incurred by inventory holds."



Rapid access to *S. aureus* information enables food processors to more effectively manage their operations. Quicker access to key microbial information allows for faster decisions on when to release, rework or reject raw, in-process or finished food products, or when to shut down and clean processing lines. "With timely microbial information, food processing plants have more control over their processes and more confidence about the quality of their food products," said Habas.

"Testing for *S. aureus* is important in the food processing industry to indicate substandard handling or sanitation issues," added Habas. "Thirty percent of the general population is chronically *S. aureus*-positive and may shed the organism during food handling. Processes involving human manipulation of food products are particularly vulnerable to contamination." Testing for *S. aureus* provides HACCP verification of effective environmental sanitation. In addition, the Petrifilm Rapid *S. aureus* Count plate test provides a food microbial risk assessment. Higher levels of *S. aureus* (greater than 10<sup>6</sup> CFU) pose a potential health hazard.

The new Petrifilm Rapid *S. aureus* Count plate provides food and beverage processors results equivalent to the combined three-plate Baird-Parker agar and tube coagulase tests in a single test procedure. It consists of a sample-ready Petrifilm plate that has been coated with modified Baird-Parker nutrients. The plate is accompanied by a small blue disk that has been coated with a microbial growth indicator and a thermonuclease (TNase) reactive agent. This disk is placed within the plate's well during the final steps of the test procedure.

The Petrifilm product also provides confirmation of all suspect isolates in



a single procedure. With conventional testing methods, confirmation of presumptive *S. aureus* results usually involves the subjective selection of typical and representative colonies from the plate for further testing, often allowing atypical and/or other problematic *S. aureus* colonies to pass undetected.

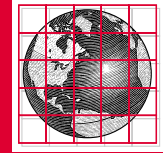
The Petrifilm Rapid *S. aureus* Count plate is the latest offering in 3M's sample-ready Petrifilm plate format, which reduces total cost per test. Aerobic, coliform, *E. coli*, high-sensitivity coliform, rapid coliform, *Enterobacteriaceae*, and yeast and mold tests are also available in the Petrifilm product format.

For more information on the Petrifilm Rapid *S. aureus* Count plate, call the 3M Customer Helpline at **1-800-228-3957**, or reach us by e-mail at [microbiology@3M.com](mailto:microbiology@3M.com).

### Take advantage of our incubator promotion!

Purchase one or more cases of Petrifilm Rapid *S. aureus* Count plates 6424 and receive a 3M<sup>™</sup> Incubator 6426 for \$150\* or purchase five or more boxes of Petrifilm Rapid *S. aureus* Count plates 6423 and receive the 3M Incubator for \$255.\* **Offer expires July 31, 1999.** To order, call 1-800-328-1671.

\* Program currently available in the U.S. only. 3M Incubator is regularly priced at \$355. Special promotional price limited to one incubator per plant.



## 3M Canada Launches Scholarship Program

In June, a student researching in the field of food safety, microbiology or preservation will be awarded the first annual 3M Canada Post Graduate Scholarship at the International Institute of Food Technology (IFT) global conference in Chicago. The \$3,000 cdn scholarship is sponsored by 3M Canada Microbiology Products in conjunction with the Canadian Institute of Food Science and Technology. It is open to masters or doctoral degree students studying at a Canadian university.

“We want to support not only the food industry in its growth and research, but also individual microbiologists of the future whose ideas and initiative will continue to improve food quality and safety for the next generation,” said

Cindy Knight, market development manager, 3M Canada Microbiology Products. “Another objective is to build relationships with educators and institutions of higher learning. These relationships can provide tremendous resources for research information and highly qualified future employees.”

According to Gisele Atkinson, professional services, 3M Canada Microbiology Products, “The competitive grant recognizes innovative research addressing topics of food quality and safety. Applicants are required to write a synopsis of their research, clearly defining how their research could potentially impact the food industry. We consulted with educators and food industry leaders to set the award criteria.”

3M is committed to supporting future innovations in food microbiology. A panel including representatives of 3M Canada and the Canadian Institute of Food Science and Technology will do final judging.

In addition to the scholarship grant to be presented during a special award ceremony at the IFT conference, the winner receives complimentary registration and expenses for travel to and accommodations at the conference. Applications for next year’s 3M Canada Post Graduate Scholarship may be obtained by writing to: 3M Canada Scholarship, Canadian Institute of Food Science and Technology National Office, P.O. Box 152, Apple Hill, Ontario, Canada, K0C 1B0.



### *3M Technical Service*

## You Can Count On Us to Help

We at 3M Microbiology Products are committed to helping your business succeed and want you to enjoy the best service possible. Do you have a specific question you need answered? Or need hands-on training at your facility? Our knowledgeable technical staff from around the world is ready to assist you with any questions you may have.

Getting in touch with us is just a phone call or e-mail away. For your convenience, we’ve listed the different ways you can reach us to get the information you need.

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Japan	81-427-70-3299	81-427-71-7220	1-651-733-7562
Latin America	52-5-2-70-2071	52-5-2-70-2177	1-651-733-7562
USA	1-800-328-6553	1-651-733-1804	1-800-228-3957

You can also send us your questions via electronic mail at [microbiology@3M.com](mailto:microbiology@3M.com).

For our Fax on Demand service, please call 1-800-328-6553 or 1-650-556-8426.

# Advancing Staph Testing Into the 21<sup>st</sup> Century



By: Frank Yiannas  
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Health  
Walt Disney  
World Co.

The ability of *Staphylococcus aureus* to cause illness through the ingestion of food has been studied regularly since the late nineteenth century, yet it remains a significant cause of foodborne disease today.<sup>6</sup>

The continued importance of *S. aureus* as a foodborne pathogen is best illustrated by the most recent round of foodborne disease data released from the Center for Disease Control and Prevention (CDC). Between 1988–1992, foodborne staphylococcal intoxication remained the third leading cause of reported bacterial foodborne illness.<sup>4</sup> Interestingly, epidemiologists claim that reported cases are just the tip of the iceberg and that the actual incidence of disease is much larger. Although the actual incidence is not known with accuracy, it is estimated that 1.5 million cases of foodborne illness each year in the U.S. are due to *S. aureus*.<sup>6</sup>

Economic losses due to *S. aureus* are reported to be significant. In the U.S., it has been estimated that staphylococcal intoxication is one of the most economically important foodborne diseases at an annual cost of \$1.5 billion.<sup>14</sup>

Because of its continued importance as a foodborne pathogen, as well as being a good indicator of sanitation and post-process contamination, food laboratories throughout the world routinely test for *S. aureus*.

Several selective and differential agars have been developed for the isolation and identification of staphylococci. The use of these media are usually based on salt tolerance, ability to reduce tellurites to metallic tellurium

with the consequent formation of black colonies, egg yolk reaction, gelatin hydrolysis, mannitol fermentation, and other characteristics. None of these properties alone can guarantee correct identification; therefore, additional tests are still required.

The ability to produce one or more of the known enterotoxins has been generally associated with *S. aureus* strains that produce coagulase and thermostable nuclease. Accordingly, routine laboratory procedures utilize the detection of *S. aureus* as an indicator of the potential presence or production of enterotoxins. Historically, coagulase production has been one of the most commonly used criterion for confirming the presence of *S. aureus* in foods. However, researchers have shown that coagulase production is not necessarily unique to *S. aureus* nor an absolute predictor of potential enterotoxin production.<sup>5</sup> Also, there are other staphylococcal species which are capable of producing enterotoxins.<sup>1, 5</sup>

Therefore, conclusive proof of staphylococcal food poisoning still largely depends on the detection of one or more of the known enterotoxins in food. However, because toxin detection is time consuming and complicated, efforts have been made to correlate staphylococcal toxin production with other physiochemical characteristics of the organism. Although it has limitations, coagulase production remains the most widely used method for confirming the presence of *S. aureus* in foods or predicting the ability of staphylococcal isolate to produce enterotoxin.

Currently, Baird-Parker agar is typically used for selective isolation and enumeration of staphylococci in foods. Suspect colonies isolated on Baird-Parker agar are generally confirmed with the coagulase tube test, thus making the current methodology lengthy (i.e., three days) and subject to interpretation (partial clotting). In addition, media preparation can be costly and labor intensive due to the addition of an egg yolk additive and requirement to promptly use prepared plates.

Production of a heat stable deoxyribonuclease, better known as thermostable nuclease (TSN or TNase), has been shown to be an alternative and equivalent means of identifying *S. aureus*.<sup>3, 11, 12, 13</sup> The validity of this test is well documented in the scientific literature and it is referenced as an important confirmatory test in authoritative sources.<sup>2, 8</sup> For example, in one study of particular interest, it was reported that among enterotoxin producing strains of *S. aureus*, there was a slightly greater correlation with TSN production (95%) than with coagulase production (93%).<sup>13</sup>

Interestingly, staphylococcal species, *S. hyicus* and *S. intermedius*, which are reported to be enterotoxigenic, have been shown to produce TSN. Rather than being simply viewed as equivalent, additional studies should be conducted to determine if TSN detection is better than coagulase production for predicting the ability of a staphylococcal isolate to produce enterotoxins.

Despite its reported reliability as an alternative means of identifying *S. aureus*, the TSN test has not gained widespread popularity; largely in part, because of the complexity of the original testing procedure.<sup>12</sup> The development of a simplified method which allows TSN-producing staphylococcal colonies to be rapidly detected and enumerated directly on selective plating media has made the TSN test an attractive alternative to coagulase testing.<sup>10</sup> Using the simplified TSN test, following an initial shortened incubation, selective staphylococcal plates with developed colonies are incubated at an elevated temperature for a very short period of time to inactivate heat labile nucleases. After the inactivation step is complete, the plates are overlaid with a toluidine blue O-deoxyribonucleic acid medium and reincubated for a short period of time, generally a few hours. Following the final incubation, colonies which have produced TSN are surrounded by bright pink halos. The likelihood of misreading the TSN test is remote, due to the distinct color change accompanying a positive reaction.

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## Advancing Staph Testing Into the 21st Century

Advantages to the simplified TSN test include:

- more rapid than traditional methodologies
- easy to read, clear-cut visual indicator as compared to the coagulase tube test

In closing, as we approach the 21<sup>st</sup> century, we have heard a lot of discussion about the diminishing role of microbiological testing with the development of HACCP. However, recent surveys indicate that food operators and consumers alike view improved pathogen detection as a favored approach to improving the safety of our food supply.<sup>7</sup> As microbiological laboratories are looked upon to play a key role in advancing our food safety mission, it is critical that we continue to search for newer and better testing methods. 3M's

development of a ready to use, rapid, and easy method for enumerating and identifying *S. aureus* based on its ability to produce a thermostable nuclease (TSN) is consistent with this strategy. I encourage you to evaluate the role of rapid TSN detection in your staphylococcal testing program and assist with advancing staph testing into the 21<sup>st</sup> century.

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