3M™ Petrifilm™ Staph Express Count Plate for the Rapid Enumeration of Staphylococcus aureus in Foods – Collaborative Study

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INTRODUCTION

Staphylococcus aureus has been recognized as a cause of foodborne illness since the late nineteenth century. Identification of this potential pathogen is important for food safety because approximately 35% of S. aureus strains produce at least one type of heat-stable enterotoxin that can cause intoxication and food poisoning. The 3M™ Petrifilm™ Staph Express Count plate and the 3M™ Petrifilm™ Staph Express disk have been developed to enumerate S. aureus in foods.

The Petrifilm Staph Express Count plate is a sample-ready culture medium system which contains a cold-water-soluble gel. The chromogenic, modified Baird-Parker medium in the plate is selective and differentiable for S. aureus. Diluted samples are added at a volume of 1.0 ml per plate. The gel is allowed to solidify after incubation at 35 ± 1°C for 24 ± 2 h. The colonies are counted and the results are compared to the control sample and three levels of inoculated sample, consisting of a control sample and three levels of inoculated sample, each in duplicate. Each sample was tested for S. aureus using the Petrifilm Staph Express Count plate method, as well as AOAC Official Method® 975.55, the Staphylococcus aureus Test Kit for the Rapid Identification of S. aureus. The colonies were counted and the results were compared to the control sample and three levels of inoculated sample, each in duplicate.

METHODS

Microbiological Analysis

The 3M™ Petrifilm™ Staph Express Count plate and disk method was used to enumerate S. aureus in foods. The Petrifilm Staph Express disk is used to identify S. aureus from all inoculum colonies. The Petrifilm Staph Express disk is used whenever colonies other than red-violet are present on the plate, for example, black colonies or blue-green colonies (see Figure 2).

The Petrifilm Staph Express disk contains a dip and deoxyribonuclease. S. aureus produce deoxyribonuclease (DNase), and the DNase reacts with the dip to form pink zones. When the disk is inserted into the plate and after the plate and disk are incubated for up to 6 h at 35 ± 1°C or 24 ± 2°C, S. aureus (and occasionally, Staphylococcus intermedius) produce a pink zone (see Figure 3). Count the pink zones as S. aureus, regardless of the size of the zone.

RESULTS

Twelve or thirteen laboratories participated in the study, depending on the food sample.

The mean log counts of the Petrifilm Staph Express Count plate method were not significantly different from the mean log counts of the BPA method. The repeatability variances of the Petrifilm Staph Express Count plate method were not significantly different from those for the BPA method in 26 of the 41 groups tested. In 13 groups, the repeatability variances of the Petrifilm Staph Express Count plate method was smaller in value than that of the BPA method.

CONCLUSION

The mean log counts of the 24-h Petrifilm Staph Express Count plate method and the repeatability and reproducibility variances of that method were similar to those of the 72-h BPA method for analysis of selected pre-packaged and processed foods, dairy foods, and meat, poultry, and seafood. The Petrifilm Staph Express Count plate method has been adopted official First Action by AOAC for the enumeration of S. aureus.