

NordVal Certificate

| | |
|----------------------|---|
| Issued for: | 3M™Petrifilm™ Yeast and Mould Count Plate |
| NordVal No: | 016 |
| First approval date: | 5 May 2003 |
| Renewal date: | 1 June 2011 |
| Valid until: | 1 June 2013 |

3M™Petrifilm™ Yeast and Mould Count Plate

Manufactured by:
3M Health Care,
Microbiology Products,
St. Paul,
Minnesota 55114-1000
USA

Supplied by:
3M MEDICA,
Hammfelddamm 11,
D-41453 Neuss,
Germany

fulfils the requirements of the NordVal validation protocol. The 3M™ Petrifilm™ Yeast and Mould Count Plate performance has been compared to the FDA Bacteriological Analytical Manual (BAM), 8th Ed: Yeast and Mold Method.

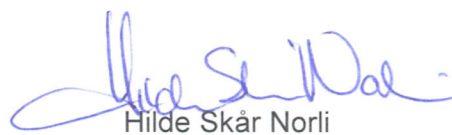
The results document no statistical difference in the performances between the methods.

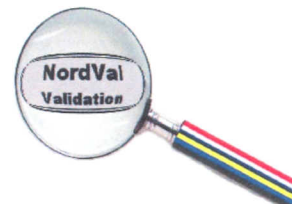
The 3M™ Petrifilm™ Yeast and Mould Count Plate has been fully collaboratively validated and corresponds to AOAC 997.02: Yeast and Mold Counts in Foods Dry Rehydratable Film Method (Petrifilm™ Method).

Date: 01.06.2011

Yours sincerely


Sven Qvist
Chair of NordVal


Hilde Skår Norli
NMKL Secretary General



PRINCIPLE OF THE METHOD

The 3M Petrifilm Yeast and Mould Count Plate is a sample-ready-culture-medium system which contains Sabouraud agar nutrients, antibiotics, a cold-water-soluble gelling agent, and an indicator that facilitates yeast and mould enumeration. Undiluted or diluted samples are added to plates at a rate of 1mL/plate. Sample is spread over a surface of 30 cm². Gelling agent is allowed to solidify, plates are incubated, and then yeasts and moulds are counted.

To differentiate yeast and mould colonies, look for one or more of the following characteristics:

Yeast:

- √ Small colonies
- √ Colonies have defined edges
- √ Pink-tan to blue-green in color
- √ Colonies appear raised
- √ Colonies have a uniform color

Mould:

- √ Large colonies
- √ Colonies have diffuse edges
- √ Variable color
- √ Colonies appear flat
- √ Colonies have a dark center

FIELD OF APPLICATION

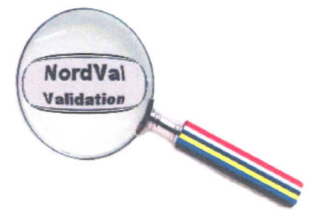
The method has been tested on foods.

FULL COLLABORATIVE STUDY OF THE 3M™ PETRIFILM™ YEAST AND MOULD COUNT PLATE

The alternative method was compared against the BAM method in a full collaborative study. The results are published in J.AOAC Int. **80**, 806 (1997), and is summed up in the following tables.

Method performance for the determination of **mould** count in foods by 3M™ Petrifilm™ yeast and mould count plate.

| Product | Level | Method | Mean log cfu/g | sr log cfu/g | r log cfu/g | sR log cfu/g | R log cfu/g |
|--------------|-------|--------|-------------------|-----------------|----------------|-----------------|----------------|
| Orange juice | Low | PYM | 2.50 | 0.13 | 0.36 | 0.17 | 0.49 |
| | | BAM | 2.50 | 0.33 | 0.94 | 0.38 | 1.07 |
| | High | PYM | 3.23 | 0.18 | 0.52 | 0.37 | 1.05 |
| | | BAM | 3.21 | 0.12 | 0.33 | 0.36 | 1.01 |
| Hot dog | Low | PYM | 2.35 | 0.32 | 0.91 | 0.80 | 2.26 |
| | | BAM | 2.20 | 0.08 | 0.21 | 0.98 | 2.78 |
| | High | PYM | 3.09 | 0.11 | 0.31 | 0.97 | 2.76 |
| | | BAM | 3.06 | 0.19 | 0.54 | 0.98 | 2.76 |
| Yogurt | Low | PYM | 2.34 | 0.16 | 0.46 | 0.75 | 2.11 |
| | | BAM | 2.15 | 0.11 | 0.31 | 0.92 | 2.59 |



| Product | Level | Method | Mean log cfu/g | sr log cfu/g | r log cfu/g | sR log cfu/g | R log cfu/g |
|-----------|-------|--------|-------------------|-----------------|----------------|-----------------|----------------|
| | High | PYM | 3.21 | 0.43 | 1.22 | 0.50 | 1.42 |
| | | BAM | 3.00 | 0.17 | 0.47 | 0.92 | 2.59 |
| Ketchup | Low | PYM | 2.17 | 2.52 | 7.13 | 2.61 | 7.38 |
| | | BAM | 1.90 | 0.27 | 0.75 | 0.67 | 1.88 |
| | High | PYM | 2.76 | 0.42 | 1.20 | 0.50 | 1.41 |
| | | BAM | 2.78 | 0.18 | 0.50 | 0.80 | 2.40 |
| Corn meal | Low | PYM | 2.28 | 0.69 | 1.95 | 0.76 | 2.16 |
| | | BAM | 2.29 | 0.39 | 1.11 | 0.63 | 1.78 |
| | High | PYM | 2.50 | 0.61 | 1.73 | 0.76 | 2.11 |
| | | BAM | 2.54 | 0.51 | 1.44 | 0.64 | 1.80 |
| Cake mix | Low | PYM | 1.73 | 0.30 | 0.85 | 0.68 | 1.92 |
| | | BAM | 1.57 | 0.52 | 1.48 | 0.82 | 2.31 |
| | High | PYM | 1.73 | 0.49 | 1.37 | 0.78 | 2.20 |
| | | BAM | 1.71 | 0.31 | 0.88 | 0.77 | 2.18 |

Method performance for the determination of yeast count in foods by 3M™ Petrifilm™ yeast and mould count plate.

| Product | Level | Method | Mean log cfu/g | sr log cfu/g | r log cfu/g | sR log cfu/g | R log cfu/g |
|--------------|-------|--------|-------------------|-----------------|----------------|-----------------|----------------|
| Orange juice | Low | PYM | 1.72 | 0.48 | 1.36 | 0.77 | 2.18 |
| | | BAM | 1.72 | 0.51 | 1.43 | 0.82 | 2.33 |
| | High | PYM | 2.93 | 0.26 | 0.74 | 0.38 | 1.08 |
| | | BAM | 2.95 | 0.15 | 0.43 | 0.36 | 1.03 |
| Corn meal | Low | PYM | 1.32 | 0.98 | 2.76 | 1.48 | 4.18 |
| | | BAM | 1.49 | 0.81 | 2.28 | 1.45 | 4.09 |
| | High | PYM | 1.99 | 1.16 | 3.28 | 1.51 | 4.26 |
| | | BAM | 2.77 | 1.08 | 3.07 | 1.32 | 3.73 |
| Cake mix | Low | PYM | 1.51 | 0.58 | 1.64 | 1.11 | 3.14 |
| | | BAM | 1.23 | 0.75 | 2.12 | 1.18 | 3.35 |
| | High | PYM | 2.09 | 0.25 | 0.70 | 1.06 | 3.00 |
| | | BAM | 2.07 | 0.40 | 1.13 | 1.14 | 3.22 |

sr = standard deviation of the repeatability

r = 2.8 x sr

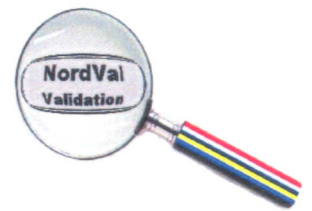
sR = standard deviation of the reproducibility

R = 2.8 x SR

PYM = Petrifilm yeast and mould count plate

BAM = Reference method

The reproducibility is high for both the alternative and the reference method, and can only be considered satisfactory for orange juice. Corn meal seems to be a problematic matrix, as the results show poor precision for both methods in the determination of yeast. Except for the results shadowed with grey, the repeatability results are satisfactory.



CONCLUSION

No statistical differences could be found between the 3M™ Petrifilm™ yeast and mould count plate and the BAM reference method.