

EFFECTIVE DATE	LABORATORY TEST METHOD	METHOD CODE
REVISED: 06/27/25	TOTAL AEROBIC PLATE COUNT	TPC, PTPC
REPLACES: 10/27/17		PAGE 1 OF 2
KEY WORDS: Total Plate Count, Standard Plate Count, Mesophilic Aerobic Plate Count, Petrifilm™ Aerobic Plate Count		

1. SCOPE:

1.1. The procedure estimates the level of aerobic and facultative anaerobic mesophilic microorganisms in foods, animal feeds, food and feed ingredients, environmental, and water samples.

2. PURPOSE:

- 2.1. Mesophilic aerobic microbial population levels are estimated by plating serial dilutions from a sample using pour plate (TPC) or 3M™ Petrifilm™ Aerobic Count plates (PTPC). When performed under aseptic conditions, the Aerobic Plate Count serves as a reliable indication of the sanitary quality of a product, especially when accepted standards are known for a product.
- 2.2. Chemical preservatives or other inhibitors in a sample can cause inhibition of growth on the lower dilutions of a total aerobic plate count.
- 2.3. Microbial cells often occur as clumps of cells. Because a colony may have resulted from a clump of cells, the results from plating methods are an estimation of the number of colony forming units (CFU), not an actual cell count from the product.
- 2.4. Known Interferences:
 - 2.4.1. The accuracy of colony count methods may be limited by the failure of some microorganisms to form visible colonies on the agar medium. This failure can result from nutritional deficiencies of the medium, unfavorable oxygen tension, unfavorable incubation temperature or length of incubation, or failure of an injured cell to repair itself.
 - 2.4.2. 3M™ Petrifilm™ plates cannot be used with buffers containing citrate, bisulfate, or thiosulfate.
 - 2.4.3. Some micrococci are inhibited by 2,3,5-Triphenyltetrazolium Chloride.
- 2.5. The standard lowest confidence level is 10 Colony Forming Unit (CFU)/ gram (g) or per milliliter (ml) for the pour plate, spread plate and Petrifilm™ procedures when 1 milliliter (ml) of a 1:10 dilution is plated. The pour plate procedure's confidence level can be lowered to 1 CFU/g or CFU/ml if 10 mls of a 1:10 dilution is plated among three plates. The Petrifilm™ procedure's confidence level can be lowered to 1 CFU/g or CFU/ml if 10 mls of a 1:10 dilution is plated among ten Petrifilm™ plates. The lowest confidence level for the heterotrophic aerobic plate count is 1 CFU/ml when 1 ml of the water sample is plated directly.

3. PRECISION:

3.1. Assay precision may vary with test matrix and physiological state of the microorganisms in the test sample. Guidelines used to describe method precision are defined in NPSOP3040, *Verification of Microbiological Tests*.

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4. REFERENCES

- 4.1. LI-00.765-5 Microbiology Sample Preparation; December 2021
- 4.2. U.S. Food and Drug Administration Bacteriological Analytical Manual, On Line, Chap 3 (6/16/2021 online update).
- 4.3. 3M™ Petrifilm™ Aerobic Count Plate (AOAC 990.12 Validation Scope – In foods, incubation 48 ± 3 hours at 35C ± 1C).