EFFECTIVE DATE	N P Analytical Laboratories	METHOD CODE
REVISED: 6/27/25	LABORATORY TEST METHOD SUMMARY	XM TTPC
REPLACES: 10/15/22	ENUMERATION OF THERMOPHILIC MICROORGANISMS	PAGE 1 OF 1
KEY WORDS: thermophilic total plate count, thermophilic plate count		

1. SCOPE AND PURPOSE:

This procedure estimates the level of thermophilic aerobic and facultative anaerobic microorganisms in food and feed ingredients, and environmental samples.

2. PRINCIPLE:

2.1. Thermophilic microorganisms are those that not only survive relatively high temperatures but also require high temperatures for growth and metabolic activity. Thermophiles have an optimum growth temperature between 50 and 60° C. They may be found in cultivated soils and agricultural commodities and on processing equipment held at high temperatures for long periods. Sugars and starches may have high levels. Thermophiles can cause spoilage of canned foods that are inadequately cooled and subsequently stored at high temperatures.

2.2. The plate count method described in this procedure (or a spread plate method can be utilized; refer to NPSOPM1001) is designed to determine the populations of viable thermophilic microorganisms in a product. This procedure may be used to enumerate aerobic and facultative anaerobic thermophiles but is not designed to enumerate strictly anaerobic thermophilic microorganisms.

2.3. Chemical preservatives or other inhibitors in a sample can cause inhibition of growth on the lower dilutions of a total plate count.

2.4. Microbial cells often occur as clumps of cells. 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, not an actual cell count from the product.

2.5. Known Interferences: 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.

2.6. The standard lowest confidence level is 10 Colony Forming Unit (CFU)/gram (g) or per milliliter (ml) for the pour plate procedure when 1 milliliter (ml) of a 1:10 dilution is plated. The procedure's lowest 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.

3. PRECISION:

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.*

4. REFERENCES:

4.1. Bridges, Anne. AACC International Approved Methods. AACC International, 2009. DOI: 10.1094/AACCIntMethod-42-45.01

4.2. Compendium of Methods for the Microbiological Examination of Foods, APHA, 5th Edition, 2015, Chapter 26

4.3. Standard Methods for the Examination of Dairy Products, APHA, 16th Edition, Chapter 8