



FOOD SAFETY LAB / MILK QUALITY  
IMPROVEMENT PROGRAM

*Standard Operating Procedure*



Title: **Spore Pasteurization**

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Approved by:

## **Spore Pasteurization**

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## **SECTION 1 INTRODUCTION**

### **1.1 Purpose**

The purpose of this document is to set forth standard guidelines for performing spore pasteurization for the determination of spore counts in raw, pasteurized, and powdered dairy products.

### **1.2 Scope**

This SOP applies to the Food Safety Lab and the Milk Quality Improvement Program. The protocols may also be used by laboratory members from other locations.

### **1.3 Definitions**

SP- Spore Pasteurization

MSC- Mesophilic Spore Count

TSC- Thermophilic Spore Count

PSC- Psychrotolerant Spore Count

TC- Temperature Control

### **1.4 Safety**

Wear gloves, safety glasses, and other appropriate personal protective equipment for the entire procedure.



## **SECTION 2      MATERIALS**

- **Shaking water bath capable of reaching and maintaining 80°C**
- **Ice**
- **Thermometer**
- **Sterile 250 mL glass bottles with screw on cap if more than 50mL of sample is needed for plating**
- **Sterile 50 mL glass vials with screw on cap if less than 50mL of sample is needed for plating**
- **Temperature control glass bottle with hole in cap**



## **SECTION 3 PROCEDURES**

### **3.1. Sample preparation**

- 3.1.1. Ensure uniform samples, shake 25 times in a 1-foot arc within 7 seconds prior to transferring sample to sterile bottles in accordance with *Standard Methods for the Examination of Dairy Products* (Laird et al., 2004).
- 3.1.2. Aseptically transfer 100 mL (or 35 mL if using a 50 mL glass vial) of raw milk or raw, pasteurized, or hydrated powder product to a 250 mL sterile glass bottle (or a 50 mL glass vial) with screw cap.
- 3.1.3. Prepare a TC with the same volume of raw, pasteurized, or hydrated powder product to be processed in a 250 mL glass bottle (or a 50mL glass vial) with hole in the screw cap for thermometer.

### **3.2. Spore Pasteurization**

- 3.2.1. Set a water bath at 80°C and ensure the water level will exceed the level of the product in the bottle by 4 mm.
- 3.2.2. Place samples and temperature control in water bath and turn on the shaking mechanism.
- 3.2.3. Start timing the 12-minute hold time when the temperature of the TC has reached 80°C. Maintain the temperature at 80°C ± 1°C for the duration of the hold time.
- 3.2.4. At the end of the hold time, immediately remove samples and TC from the water bath and place on ice.
- 3.2.5. When the temperature of the samples and TC cool to 6°C or lower proceed with sample analysis.
  - 3.2.5.1. SP treated samples plated and incubated at 32°C for 24-48 hours constitutes an MSC.
  - 3.2.5.2. SP treated samples plated and incubated at 55°C for 24-48 hours constitutes a TSC.
  - 3.2.5.3. SP treated samples plated and incubated at 6°C for 10 days constitutes a PSC.



## SECTION 4 TROUBLESHOOTING

## SECTION 5 REFERENCES

*Huck, J.R., N.H. Woodcock, R.D. Ralyea, and K.J. Boor, 2007. Molecular subtyping and characterization of psychrotolerant endospore-forming bacteria in two New York State fluid milk processing systems. J. Food Prot. 70:2354-2364.*

*Laird, D. T., A. Gambrel-Lenarz, F. M. Scher, T. E. Graham, and R. Reddy. 2004. Microbiological Methods for Dairy Products. Pages 249–252 in Standard Methods for the Examination of Dairy Products. 17<sup>th</sup> ed. H. M. Wehr and J. F. Frank, ed. Am. Public Health Assoc., Washington, DC.*

*Wehr, H.M. and J.F. Frank eds. 2004. Standard Methods for the Examination of Dairy Products. 17<sup>th</sup> ed. American Public Health Association, Washington, D.C.*

## SECTION 6 METHOD VERSION & CHANGES

VERSION	DATE	EDITOR	COMMENTS
Version 1	11/21/2011	Nicole	Original SOP
Version 2	04/30/2020	Rachel E.	Edited to fit the new formatting style. Also added details for using 50 mL glass vials
Version 3			