MQIP LAB Standard Operating Procedure		
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Spiral Plating for raw and powdered dairy products

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SECTION 1 INTRODUCTION

1.1 Purpose

The purpose of this document is to set forth standard guidelines for spiral plate counts of raw, pasteurized and powdered dairy products.

1.2 Scope

This SOP applies to the Milk Quality Improvement Program (MQIP) Lab

1.3 Definitions

SPC – Standard Plate Count agar

BHI – Brain Heart Infusion agar

SECTION 2 MATERIALS

- **Standard Plate Count (SPC) Agar.** Pre-poured SPC plates must be prepared and dried prior to use with the spiral plater.
- **Brain Heart Infusion (BHI) Agar.** Pre-poured BHI plates must be prepared and dried prior to use with the spiral plater.
- **70% Ethanol**
- **Kimwipes**
- **Incubators** Set at 55°C and 32°C
- **Spiral Plater**
- **Phosphate Buffer Dilution Blanks.** 900 µL and 99 mL volumes.
- **Variable Volume Pipettes.** 100-1000 µL volume and corresponding tips
- **Vortex**

SECTION 3 PROCEDURES

3.1. Pre-poured agar plate preparation

3.1.1. SPC and BHI agar plates are prepared using an automatic dispenser with sterile delivery system. The plates are allowed to solidify on a level surface then stored in closed bags at 4C prior to use. Prior to plating plates are allowed to dry and come to room temperature.

3.2. Sample preparation

3.2.1. Raw milk sample preparation
3.2.1.1. Raw milk samples are maintained at or below 6°C from arrival to completion of analysis. Analysis begins within 24 hours of sample receipt.
3.2.1.2. Samples are shaken 25 times in a 1 foot arc within 7 seconds prior to plating, dilution or heat treatment. If the sample is not plated or diluted within 3 minutes re-shake sample.
3.2.1.3. Prior to opening the container, wipe the container down with a kimwipe and 70% ethyl alcohol.
3.2.1.4. Raw milk can now be plated or heat treated.

3.2.2. Powdered product sample preparation
3.2.2.1. Powdered products are asceptically mixed to ensure a uniform sample.
3.2.2.2. 11g of powdered product is transferred directly into 99 mL of phosphate buffer (1:10 dilution).
3.2.2.3. Hydrated powder products are shaken 25 times in a 1 foot arc within 7 seconds prior to plating or heat treatment. If the sample is not plated within 3 minutes re-shake sample.
3.2.2.4. Powdered product sample can now be plated or heat treated.

3.3. Sample plating

3.3.1. Plating of non-heat treated samples
3.3.1.1. Label 4 pre-poured SPC plates per non-heat treated raw or powder product with product identifier, dilution and date.
3.3.1.2. Each non-heat treated product is plated undiluted as well as at 1:100 dilution, both in duplicate.
3.3.1.3. Plate each sample using the default 50 Exponential mode on the spiral plater, cleaning between each sample.
3.3.1.4. Incubate plates at 32°C for 24-48 hours prior to preforming colony counts.

3.3.2. Plating of heat treated samples
3.3.2.1. Label sufficient number of BHI plates to plate undiluted heat treated sample in duplicate.
3.3.2.1.1. The sensitivity of this test can be increased by plating in quadruplicate as opposed to in duplicate.

3.3.2.2. Plate each sample using the 250 Uniform mode on the spiral plater, cleaning between each sample.
3.3.2.3. Incubate plates at 32°C or 55°C for 24-48 hours prior to preforming colony counts.

SECTION 4 TROUBLESHOOTING

SECTION 5 REFERENCES

Wehr, H. M. and J. F. Frank eds. 2004. Standard Methods for the Examination of Dairy Products. 17th ed. American Public Health Association, Washington, DC.

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