Cleaning and Sanitizing Food Contact Surfaces Laboratory

Objective:

- To measure the microbial load of different surfaces, before and after cleaning and sanitizing, with standard microbiological methods and a rapid ATP-bioluminescence assay.

Lab Safety - ATTENTION:

- Participants are required to wear gloves and a lab coat at all times during the laboratory sessions (All safety equipment will be provided).
- Participants must wash their hands when leaving the laboratory.

Materials & Methods:

Cleaning and sanitizing stations:

Scrub brushes
Soap - Detergent
Sanitizer Bottles - Chlorine, Quaternary Ammonium, & 70% Ethanol

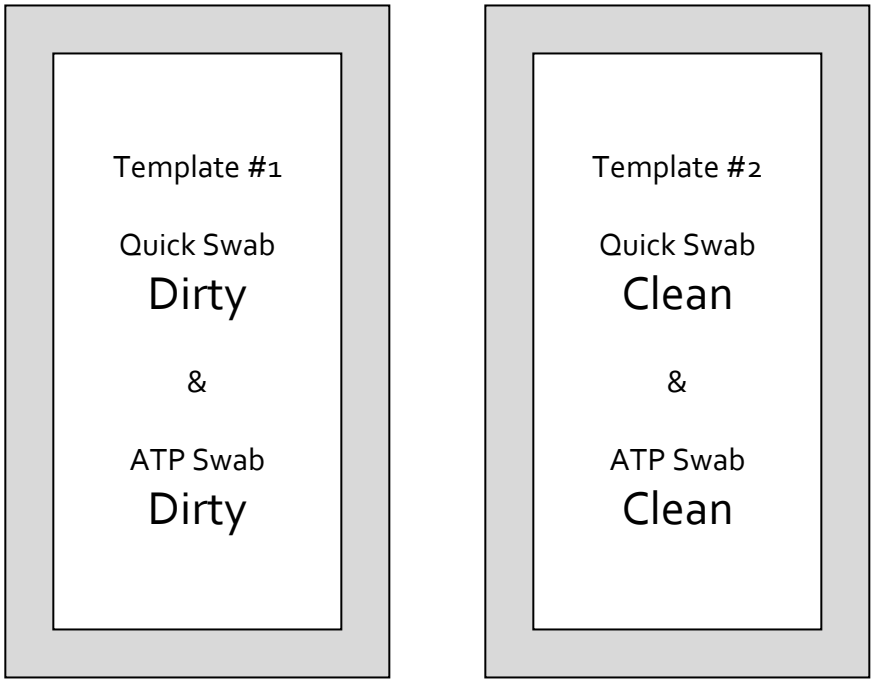
Supplies for measurements of microbial load:

3M™ Petrifilm™ Rapid Aerobic Plate Count (APC) plates
3M™ Quick Swabs
3M™ Clean-Trace™ ATP Bioluminescence-swabs
3M™ Clean-Trace™ NG Luminometer

Materials at each station:

- Gloves
- Contaminated surfaces
- 2 disposable 50 cm^2 templates (5x10)
- 2 3M™ Quick Swabs
- 2 APC Petrifilm™
- 3M™ plastic Petrifilm™ spreader
- 2 3M™ Clean-Trace™ ATP swabs
- Sharpie

Swabbing Template Diagram:



Labeling:

Label your Aerobic Plate Count Petrifilm™ according to the following example:

Lab Session – Surface Type – Sample – Your Initials

Laboratory Session		
2:00 -2:50pm A	3:00 – 3:50pm B	4:00 – 4:50pm C

Surface Type			
There are four different types of surfaces on the bench top, choose one to work with			
T – Tile	S – Stainless Steel	P – Plastic	W – Wood

Sample	
D = Dirty	C = Cleaned & Sanitized

Procedures:

1. Label the Aerobic Plate Count Petrifilm™ according to the example above

3M™ Quick Swab – Aerobic Plate Count Petrifilm™

2. Obtain a 3M™ Quick Swab
    a. Bend the top red snap valve at a 45° angle until a snap is heard
    b. Squeeze the bulb to transfer the liquid into the bottom of the tube toward the cotton tip
3. Using a disposable template, swab a 50 cm^2 area of your selected surface with the moistened 3M™ Quick Swab by rubbing 10 times left to right and 10 times from top to bottom
4. Place the swab back into the original tube and shake vigorously for 10 seconds to release bacteria from the swab

Aerobic Plate Count - Petrifilm™ Plating

5. Lay the Petrifilm™ flat on the bench surface
    a. Lift the top film and slowly pour the entire contents of the 3M™ Quick Swab tube onto the center of the grid surface of the Petrifilm™
6. Gently allow the top film down onto the liquid sample
7. Distribute the sample evenly using a plastic spreader
    b. The indented side of the plastic spreader goes down onto the Petrifilm™
    c. Gently apply downward pressure on the center of the spreader
        i. Note: Do not slide the spreader across the film
8. After 5 seconds remove the spreader and leave the Petrifilm™ undisturbed for one minute to allow solidification of the gel

ATP Testing – 3M™ Clean Trace™ Swab

9. Using the same disposable template from the aerobic plate count sampling, sample a different 50cm² area with an ATP swab (dry swab) by rubbing 10 times left to right and 10 times from top to bottom
    a. Note: DO NOT plunge the ATP swab into the solution in the bottom of its container, this is a dry swab
10. Place the ATP swab into its original tube and take the swab to the luminometer.
    b. When the luminometer is available, plunge the swab completely into the tube and shake side to side for 5 seconds
    c. **Immediately** place the tube into the luminometer, close the chamber cap, and press "Measure" using the green button on the right
    d. Wait for the luminometer to process you sample and record the RLU reading in the Table 2 below

How the 3M Clean-Trace NG Luminometer works to Measure Contamination:

"The 3M™ Clean-Trace™ NG Luminometer is a luminometer used in conjunction with 3M reagent kits to measure levels of contamination on surfaces and in water samples. The technology used is Adenosine Triphosphate (ATP) bioluminescence. ATP is a substance present in all animal and vegetable matter, including most food debris, bacteria, fungi and other microorganisms. Measurement of ATP is performed using an enzyme reaction, which occurs naturally in the tail of fireflies.

Luciferin/Luciferase (firefly reagent) + ATP = Light

The light emitted is in proportion to the amount of ATP. The intensity of the light emitted from a sample is measured by the 3M clean-trace NG Luminometer and is displayed in Relative Light Units (RLU)."

ATP and Surface Hygiene Testing

"The 3M™ Clean-Trace™ NG Luminometer, together with the appropriate test kit, is an effective method for monitoring the hygiene status of surfaces. ATP from both microorganisms and product residues are detected. Measurement of "total ATP" provides an important insight to the overall cleanliness. Product residues remaining on surfaces after cleaning will be a source of nutrients for any remaining microorganisms and may also protect the microorganisms from disinfectant action. Because of the fast results, use of the 3M™ Clean-Trace™ NG Luminometer allows immediate remedial action to be taken if an unacceptable result is obtained. Surfaces can be re-cleaned before production, ensuring good sanitation and contamination control."

- *3M™ Clean-Trace™ User Manual*

Cleaning & Sanitizing

11. Using the brush provide, clean your selected surface with soap and water
12. Sanitize the surface by spraying with a selected sanitizer
    a. Let sanitizer sit for 1 minute on the surface, then blot dry with a clean paper towel
        i. Note: Ideally we would let sanitizer air dry
13. Repeat steps 1-10 with the clean and sanitized surface to obtain an aerobic plate count Petrifilm™ and an ATP reading

Incubation of Petrifilm™

14. Place Petrifilm™ from both the dirty and clean surfaces in the incubator at 35°C for 24 h (overnight)
    b. Count colonies on Petrifilm™ the following day and record in Table 1 provided below.

Table 1: Aerobic plate counts of various surfaces before and after cleaning and sanitizing

Surface Type	Dirty (# of colonies)	Clean (# of colonies)	Notes *Ex. sanitizer chosen, concentration*
Plastic			
Stainless Steel			
Tile			
Wood			

Table 2: ATP testing of various surfaces before and after cleaning and sanitizing

Surface Type	Dirty (RLU)	Clean (RLU)	Notes *Ex. sanitizer chosen, concentration*
Plastic			
Stainless Steel			
Tile			

Wood			