



ENVIRONMENTAL HYGIENE MONITORING

A GUIDE FOR ENVIRONMENTAL HEALTH OFFICERS

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Rationale for the use of Environmental Sampling Products

Environmental sampling products can be used to provide evidence for process control in food premises, as an educational tool for general hygiene in food and other premises, as a tool to investigate suspected foodborne or gastrointestinal outbreak and to prepare for unknown situations.

1. Educational Tool for Process Control

The environmental sampling products can be used real time on-site to demonstrate whether a surface is cleaned and disinfected. In large industry settings these tools are often used to verify whether a cleaning process successfully removed all materials. This concept is very important, because areas where soil deposits collect can serve as a nutrient site for bacteria. Soil doesn't mean only dirt when talking about sanitation practices, it also include protein deposits and any organic / inorganic matter that can be utilized by bacteria. When bacteria multiply they can form biofilms, these layers of bacteria can change the surface pH, cause odour and taste problems in food, and most importantly provide a site where pathogenic bacteria may enter into the food supply. In the factory or restaurant setting, periodic cleaning of surfaces, especially those in contact with food, is necessary. One method of checking and verifying that the procedure and process used by the operator to clean and sanitize surfaces is working is by using environmental sampling products such as sponges and swabs. If bacteria is still present, or if protein residue is detected translates to poor sanitation methods. This creates an opportunity to look at the process at each step and to determine where improvements are needed. If desired, quantitative measurements (number of bacteria per cm^2) can be taken by the EHO and sent to the laboratory for analysis.

2. Educational Tool for General Hygiene

The environmental sampling products can be used as a method to show the importance of general hygiene. Areas of concern include, for example, handwashing, handwashing stations, buttons, doorknobs, and contact areas in institutional or community care facilities where germs or pathogens may spread between guests and residents. A determination of the quantity of bacteria, while possible, is not as important as the concept that bacteria are present. This approach is not meant to foster fear, but rather to reinforce the importance of cleaning common areas. Many people are shocked to discover exactly where bacteria can be found.

3. Tool for Investigation of Outbreaks

Environmental sampling products are useful when trying to determine the reservoirs of pathogens in any facility implicated in an outbreak. They can be viewed as another tool in the tool-kit when trying to trace down the source or secondary points of contact caused by cross-contamination. Sponge and swab samples can be sent to the laboratory for specific pathogen testing (*Salmonella*, *Campylobacter*, etc.) and if successful, biotyping of isolates and comparison to human illnesses can be ascertained. When investigating outbreaks, leftover implicated food is often not available. It may be possible to look for traces of contamination in settings where outbreaks occur. For example, if cross-contamination between raw eggs and food is implicated, both eggs, finished foods and sponge/swabs of the mixer, sink and counter can be sent before the operator cleans up. Establishing a link between the premise (as the source) can be confirmed more easily with solid lab results, and can help rule in and rule out suspected epidemiological links.

4. Prepare for Situations known and unknown

Environmental sampling products are available. Learning how to use them now, both as an educational tool, and tool for investigation of outbreaks, will prepare EHO's. These tools may aid in possible future

situations, when outbreaks being investigated involve unknown pathogens, and unknown transmission vectors.

Successful Environmental Hygiene Sampling – Inspector Notes

1. Review the file copy of the sanitation plan for the facility that you plan to sample.
2. Based on your recent experience with the operator(s) decide before you visit the facility on the equipment or surfaces that you want to sample. Where and what you sample might change when you arrive at the facility, but planning ahead will help you to identify (and remember) the problem areas from previous inspections.
3. Consider your reason for testing – one educational method is to use a contact slide and leave in place at the facility; or you may wish to demonstrate hygiene problems and want a quantitative result (sample must be sent to the laboratory for a report to be issued).
4. Determine the type of environmental sampling you require: swab samples, sponge samples, contact slides. Check availability of supplies in your department and package them individually with Lab requisitions if needed.
5. Have the following materials on hand for testing
 - Permanent felt marker for labeling samples
 - An extra bag to put garbage in as you sample, some of the environmental sampling “kits” have disposable gloves, inner bags etc. Depending on the type, you may find it awkward looking for a trash can
 - A carry bag you can put over your shoulder for all testing materials.
 - Pen and Lab requisitions
6. Upon entry to a facility inform the operator or Person in Charge of your intention to do the swabbing and the reason.
7. Review the written sanitation plan in the facility with the operator or Person in Charge.
8. Verify with your observations that the equipment and surfaces to be swabbed are still valid.
9. Before you start sampling – WASH YOUR HANDS.

A. Use and Interpretation of Swabs / Sponges as Indicators of Environmental Hygiene

Key points:

- The microbial indicator used to assess hygiene with these products is by aerobic colony count (ACC). The aerobic colony count gives the total number of bacteria able to grow in an oxygenated or aerobic environment. This is also known as the total plate count (TPC) or aerobic plate count (APC).
- This test is quantitative. The laboratory will report the total bacterial count per gram (equivalent to total bacterial count per mL). Most interpretative guides will describe CFU (colony forming unit), this means the number of bacteria found (each bacteria forms a single CFU).
- The assessment of hygiene is based on the number of bacteria found per cm^2 , therefore **the inspector should keep a record of the area sampled to determine the total CFU per cm^2**

Field Use

A. Rationale for Product Use

- Environmental sponges and swabs are intended for educational use, and not for enforcement purposes.
Potential problem for interpretation and education: normal background levels of bacteria are unknown. Data from field use should be collected for use as guideline.
- Environmental sponges and swabs can be used to assess **process control & hygiene**. This will check (provide verification) if cleaning & sanitation has been done adequately by the operator. Samples are taken of surfaces, equipment and other items after cleaning & sanitation steps are performed by the operator to assess effectiveness of process. It is assumed that after cleaning and sanitation that the surface will be clean, and microbiological results (by APC) will be clean (eg less than 5 CFU per cm^2).
- Environmental swabs and sponges can also be used as a means to **educate the operator or client about hygiene** in the facility. Sampling may occur during routine inspection when poor practices are observed. Samples are taken of any surface to show presence of bacteria, and reinforce need for correct practices and cleaning

B. Collection of Samples:

Collection of samples should follow the standard practice of due diligence. Ensure all samples are properly collected, labeled, stored and transported and employ good record-keeping.

1. Wash hands before sampling.
2. Label outside of bag with description of surface.
3. If swab or sponge is dry, pour vial containing sterile buffer into the bag containing the swab or sponge.
4. Put on disposable glove and remove swab or sponge from the bag.
5. SPONGE: Drag sponge (with excess liquid gently squeezed out) across a defined area (preferably 25 cm^2) in back and forth "grid" to completely cover the area. Repeat perpendicular to the first sampling in the same 25 cm^2 area.
SWAB: Moisten swab and press against container to express excess liquid. Using a slight rolling motion, sample a 10 cm^2 area. After the grid is done, place swab back in liquid, shake gently in the liquid, then express excess liquid into vial before repeating as follows. Repeat twice, once perpendicular, and once more diagonal to the first same area sampled.
Consult educational videos for demonstration.
6. Place in original sterile bag or vial and close tightly. Discard glove.

7. Fill out a FQ requisition with a complete description of the sample and where it was collected.
8. Indicate routine screening on requisition (ONLY aerobic plate count will be conducted)

C. Transport of Samples:

1. Place sample and requisition into a second bag. Do not send back the glove or empty buffer container.
2. Ship with ice pack to BCCDC, Environmental Services (Food Lab), Rm. 3028, 655 West 12th Ave, Vancouver, BC.

D. Sample Surfaces

The following table provides guidance on the types of surfaces suitable for sampling with environmental sponges and swabs. **Field inspectors may sample any surfaces necessary for the investigation, this table offers examples and is not prescriptive.**

Examples for Environmental Sampling using Swabs and Sponges		
Indicator Sampling - Quantitative testing: total number of bacteria reported (by APC)		
Rationale	No.	Location to Sample
A. Process control & hygiene: to determine if cleaning & sanitation has been done correctly. Samples are taken of surfaces, equipment and items after cleaning & sanitation steps performed to assess effectiveness of hygiene process.	1	Dishes after dishwashing
	2	Cutting boards
	3	Machines (belts or cutting blades)
	4	Aprons
	5	Any cleaned and sanitized surface
B. Educating client about hygiene in facility. Sampling may occur during routine inspection when poor practices are observed. Samples are taken of any surface to show presence of bacteria, and reinforce need for correct practices and cleaning. Examples, daycares, restaurants, community care facilities, schools, petting zoos, tattoo & body piercing / nail & manicure establishments.	1	Cutting boards
	2	Machines (belts or cutting blades)
	3	Aprons
	4	Hands
	5	Door knobs, door handles or any handle (coolers → bathrooms)
	6	Diaper changing areas
	7	Common touch areas in daycare
	8	Absorbent toweling

E. Interpretation

The following table will be used as the guideline for interpretation:

Interpretation	Sponges or Swabs (total CFU)	Log conversion	Counts on Surface based on 25 cm ² surface area sampled.
Clean	< 45	< 1.65	Less than 5 CFU per cm ²
Contaminated	140 to 260	2.15 – 2.41	~ 5 to 10 CFU per cm ²
Very Contaminated	> 260	> 2.41	Greater than 10 CFU per cm ²

B. Use and Interpretation of Contact Agar Slides and Protein or ATP Detection Swabs as Indicators of Environmental Hygiene

Key points:

- These products either provide instantaneous results or can be left with the operator for educational use.
- With contact agar slides the type of media on the slide determines what type of bacteria, yeast or mold is detected. Available media will detect total bacteria (APC), total *Enterobacteriaceae*, *E. coli*, yeasts and molds. They may be formulated with sanitizer neutralizing agents.
- Contact agar slides can be left with the operator to show growth over a few days, OR, can be sent to the laboratory for a quantitative result if desired.
- Swabs that detect protein residue and ATP monitoring devices provide instantaneous results.

Field Use

A. Rationale for Product Use

- Contact slides and swabs are intended for educational use, and not for enforcement purposes. *Potential problem for interpretation and education: normal background levels of bacteria are unknown. Data from field use should be collected for use as guideline.*
- Contact slides, swabs and ATP monitoring devices can be used to assess **process control & hygiene**. This will check (provide verification) if cleaning & sanitation has been done adequately by the operator. Samples are taken of surfaces, equipment and other items after cleaning & sanitation steps are performed by the operator to assess effectiveness of process. It is assumed that after cleaning and sanitation that the surface will be clean. Contact slides will detect the presence of bacteria, yeasts and molds. Swabs designed to detect protein residue will indicate the possible presence of biofilms, and areas where bacteria may be able grow and cause problems. Swabs and wipes designed to detect ATP (a ubiquitous energy molecule found in materials like plants, animals, bacteria, yeasts and molds) will show fluorescence. (note: interpretation of ATP levels is difficult without first establishing a baseline)
- Contact slides and swabs can also be used as a means to **educate the operator or client about hygiene** in the facility. Sampling may occur during routine inspection when poor practices are observed. Samples are taken of any surface to show presence of bacteria, and reinforce need for correct practices and cleaning

B. Collection and Interpretation of Samples:

Collection of samples should follow the standard practice of due diligence. Ensure all samples are properly collected, labeled, stored and transported and employ good record-keeping.

1. Wash hands before sampling.
2. Label both sides of slide or swab with description of surface.
3. CONTACT AGAR SLIDES: Press slide firmly against surface to be sampled. Do not drag or wipe.
4. If the slide is left with operator, place in a warm area, and check for bacteria in 2 to 3 days. Spots on agar surface are bacteria, colour will vary depending on agar type and bacteria.
5. If the slide is being sent to the laboratory fill out a FQ requisition with a complete description of the sample and where it was collected. Indicate routine screening on requisition (ONLY aerobic plate count will be conducted).
6. SWABS: Take swab out of tube. Roll or wipe swabs against surface to be sampled.
7. Inject swab into liquid bulb and wait up to 60 sec. "*If it's green it's clean*" is the interpretation for the Pro-TECT swab. Any sign of purple colour indicates the presence of protein.
8. ATP MONITORING DEVICES: swab or wipe the area to be sampled. Insert swab or wipe into medium and device carrier. Read level of fluorescence (follow manufacturer instruction).

C. Transport of Samples:

1. AGAR SLIDES: Place agar slide sample and FQ requisition into a bag.
2. Ship at room temperature to BCCDC, Environmental Services (Food Lab), Rm. 3028, 655 West 12th Ave, Vancouver, BC.

D. Sample Surfaces

The following table provides guidance on the types of surfaces suitable for sampling with environmental sponges and swabs. *Field inspectors may sample any surfaces necessary for the investigation, this table offers examples and is not prescriptive.*

Examples for Environmental Sampling using Contact Agar Slides and Swabs		
Indicator Sampling - <u>Quantitative testing</u>: total number of bacteria reported (by APC)		
Rationale	No.	Location to Sample
A. Process control & hygiene: to determine if cleaning & sanitation has been done correctly. Samples are taken of surfaces, equipment and items after cleaning & sanitation steps performed to assess effectiveness of hygiene process. To detect biofilms and areas where bacteria may grow (reservoirs)	1	Any cleaned and sanitized surface
	2	Liquids
	3	Aprons, cloths or towels
	4	Packaging materials
	5	Drains, inside of pipes
B. Educating client about hygiene in facility. Sampling may occur during routine inspection when poor practices are observed. Samples are taken of any surface to show presence of bacteria, and reinforce need for correct practices and cleaning. Examples, daycares, restaurants, community care facilities, schools, petting zoos, tattoo & body piercing / nail & manicure establishments.	1	Cutting boards
	2	Machines (belts or cutting blades)
	3	Aprons
	4	Hands
	5	Door knobs, door handles or any handle (coolers → bathrooms)
	6	Diaper changing areas
	7	Common touch areas in daycare
	8	Absorbent toweling

E. Interpretation

The following table will be used as the guideline for interpretation for contact slides only:

Interpretation	Sponges or Swabs (total CFU)	Log conversion	Counts on Surface based on 25 cm ² surface area sampled.
Clean	< 45	< 1.65	Less than 5 CFU per cm ²
Contaminated	140 to 260	2.15 – 2.41	~ 5 to 10 CFU per cm ²
Very Contaminated	> 260	> 2.41	Greater than 10 CFU per cm ²

C. Use and Interpretation of Swabs / Sponges for Pathogen Monitoring

Key points:

- This test is for detection of a specific pathogen.
- This test will be qualitative. The test can be used to target a specific pathogen, or, screen for a routine food poisoning pathogen. This means a numerical value will not be reported, and the pathogen will only be described as present or absent in the sample.
- As the swab or sponge is used to sample an unmeasured (representative) area the amount of area sampled is not critical.
- One swab / sponge sample is required for each pathogen tested. The laboratory will enrich the swab or sponge in nutrient buffer and conditions appropriate for the target pathogen, and will report whether the pathogen was detected or not detected.

Field Use

A. Rationale for Product Use

- During gastrointestinal outbreaks & foodborne illness clusters environmental sponges and swabs can be used to assist in pathogen detection. Areas are sampled in the attempt to discover the reservoir for the pathogen.
- Environmental swabs and sponges can also be used assess the extent of cross-contamination by the pathogen from the source to other surfaces or areas.
- Environmental swabs/sponges can be used for detection of culturable bacteria. Specifically, *Campylobacter* spp, *Clostridium perfringens*, *E. coli* 0157:H7 or other verotoxigenic *E. coli* spp, *Listeria* spp, *Salmonella* spp, *Shigella* & *Vibrio*. Bacteria can be cultured in enrichment broth, detected on agar, and eventually typed (PFGE etc.)
- Products are not appropriate for use to detect virus (eg, Norovirus) or parasites

B. Collection of Samples:

Collection of samples should follow the standard practice of due diligence. Ensure all samples are properly collected, labeled, stored and transported and employ good record-keeping.

1. Wash hands before sampling.
2. Label outside of bag with description of surface.
3. If swab or sponge is dry, pour vial containing sterile buffer into the bag.
4. Put on disposable glove and remove swab or sponge from the bag.
5. Roll swab or drag sponge across sample area.
6. Place in original sterile bag and close tightly. Discard glove.
7. Fill out a FQ requisition with a complete description of the sample and where it was collected.
8. Indicate pathogen for detection on requisition (tick either *E.coli* 0157:H7, *Salmonella*, *B. cereus*, *C. perfringens*, *L. monocytogenes* or other and specify pathogen).

C. Transport of Samples:

1. Place sample and requisition into a second bag. Do not send back the glove or empty buffer container.
2. Ship with ice pack to BCCDC, Environmental Services (Food Lab), Rm. 3028, 655 West 12th Ave, Vancouver, BC.

D. Sample Surfaces

The following table provides guidance on the types of surfaces suitable for sampling with environmental sponges and swabs. . ***Field inspectors may sample any surfaces necessary for the investigation, this table offers examples and is not prescriptive.***

Examples for Environmental Sampling using Swabs and Sponges		
Pathogen / Outbreak Sampling - <u>Qualitative testing</u>: presence / absence of pathogen reported		
Rationale	No.	<i>Any location relevant to the investigation!</i> Some examples include:
Pathogen detection: to discover the reservoir for the pathogen causing illness and to assess the extent of cross-contamination.	1	Sinks
	2	Counters
	3	Hand-washing stations
	4	Food storage areas: refrigerators, coolers
	5	Door handles (hands?); any handles
	6	Floors, drains
	7	Cloths, towels

E. Interpretation

Pathogens will be reported as present or absent from the sample. No limit of detection will be given.

Interpretation of Environmental Hygiene Sampling Results

AN EXPLANATION FOR ENVIRONMENTAL HEALTH OFFICERS & GUIDELINES FOR OPERATORS

What does the test result mean?

The laboratory report you will receive will describe the Aerobic Colony Count as CFU (colony forming units) per gram. This is the total number of bacteria present in the sample able to survive under oxygenated conditions. Abbreviations for this test you may see in the literature are APC (aerobic plate count), HPC (heterotropic plate count), TPC (total plate count), ACC (aerobic colony count), etc.

How can I explain the test result to the operator?

There are several things you can do to make these data easier for you and the operator to interpret.

1. First you must decide if the result for the sample taken needs recalculation. If you sampled a 5X5 cm area, or a 10X10 cm area, you should first divide the total number of bacteria given in the report by the area sampled (eg, by 25 or by 100). This will change the final total count.
2. Convert the total count into a number that the operator will understand. Most people are not familiar with scientific notation. Either convert the number into the long form, or find the log base 10 value. The log method is recommended, so that values can be assessed from a scale of 0 to 6 (the lower the log the better the value). A conversion table you can show operators to help explain the results is given below.

Log Value Table

Exponential value	Log value	Numerical Value	Description
1.0×10^0	0.0	1	One
1.0×10^1	1.0	10	Ten
1.0×10^2	2.0	100	Hundred
1.0×10^3	3.0	1,000	Thousand
1.0×10^4	4.0	10,000	Ten thousand
1.0×10^5	5.0	100,000	Hundred thousand
1.0×10^6	6.0	1,000,000	Million
1.0×10^7	7.0	10,000,000	Ten million

Example for converting Lab Results

You sampled 2 areas at one restaurant: (1) the counter surface, and (2) the door handle and area around the door handle of a refrigerated cooler. When you sampled the counter, you estimated that a 10X10 cm surface was sponged. For the cooler, a 5X5 cm surface was swabbed. The results that came back from the laboratory were:

Counter: 3.2×10^6 CFU/g

Cooler: 5.0×10^3 CFU/g

First step: divide these values by the area of the surface sampled

Counter: 3.2×10^4 CFU/g

Cooler: 2.0×10^2 CFU/g

Second step: convert these values into base log 10

Counter: 4.5 (\log_{10} CFU/g)

Cooler: 2.3 (\log_{10} CFU/g)

Or, convert to the long form

Counter: 32,000 CFU/g

Cooler: 200 CFU/g

Visually, you can see that either of these results are much easier to interpret than scientific notation.

3. Before discussing final results with the operator, make some predictions with them about what you would expect to find. This may be a little challenging without having established normal background levels, and is discussed below.

What are the normal values for the surface that was sampled?

At this time, there is limited field data from our own experience to answer these questions. In the industry setting, monthly, weekly and even daily sampling results provide a baseline for establishing normal background bacterial counts, and help to identify hot-spots.

This amount of testing will not be possible in most FSEs.

You must make a decision on whether the surface sampled is clean, or clean and sanitized. Some definitions are needed here:

Clean surface – is visibly clean, soil and bacteria are removed, usually with water and detergent

Sanitized surface – has been cleaned, then a secondary agent is used to eliminate the bacteria. Examples of sanitizers include quats, bleach, iodophors.

Clean surfaces may have some acceptable background levels of bacteria, whilst clean and sanitized surfaces should have no bacteria. For example, dishes from the

dishwasher should have no bacteria (having undergone a cleaning and sanitizing procedure). A counter-top freshly wiped with a cloth will be clean (with some residual background levels of bacteria); however, if you are measuring a counter-top after a process includes cleaning and sanitizing (such as a bleach or quat step, followed by a water rinse) you would expect fewer bacteria to be present. A more stringent standard should be met (lower bacterial levels). What are the standards or normal values?

The standard table we have decided on is listed below, the results from the laboratory will be reported as total CFU/g (shown highlighted in green).

Standard Interpretation Table

Interpretation	Sponges or Swabs (total CFU/g)	Log conversion	Counts on Surface based on 25 cm ² surface area sampled.
Clean	< 45	< 1.65	Less than 5 CFU per cm ²
Contaminated	140 to 260	2.15 – 2.41	~ 5 to 10 CFU per cm ²
Very Contaminated	> 260	> 2.41	Greater than 10 CFU per cm ²

The following guidelines are taken from a Finnish publication, Orion Diagnostics “A Guide to Monitoring Surface Hygiene” and the values adjusted to total CFU/g. These values are slighter stricter than those above. These values are applied to the premises:

- Surface hygiene in kitchen
- Bakeries
- Retail premises and institutional kitchens

Interpretation	Sponges or Swabs (total CFU/g)	Log conversion	Counts on Surface based on 10 cm ² surface area sampled.
Good	< 20	< 1.65	Less than 2 CFU per cm ²
Acceptable	20 to 100	2.15 – 2.41	~ 2 to 10 CFU per cm ²
Not acceptable	> 100	> 2.41	Greater than 10 CFU per cm ²

You can find more reference values from this document for other premise types. We recommend using the Standard Interpretation Table values above.

The next page is meant as a hand-out for operators to help them understand the results.

Interpretation of Hygiene Test Results (Operator Worksheet)

Result Conversion Table

Exponential value	Log value	Numerical Value	Description
1.0 X 10 ⁰	0.0	1	One
1.0 X 10 ¹	1.0	10	Ten
1.0 X 10 ²	2.0	100	Hundred
1.0 X 10 ³	3.0	1,000	Thousand
1.0 X 10 ⁴	4.0	10,000	Ten thousand
1.0 X 10 ⁵	5.0	100,000	Hundred thousand
1.0 X 10 ⁶	6.0	1,000,000	Million
1.0 X 10 ⁷	7.0	10,000,000	Ten million

Surface Hygiene Guideline

Interpretation	Sponges or Swabs (total CFU/g)	Log conversion	Counts on Surface based on 25 cm² surface area sampled.
Clean	< 45	< 1.65	Less than 5 CFU per cm ²
Contaminated	140 to 260	2.15 – 2.41	~ 5 to 10 CFU per cm ²
Very Contaminated	> 260	> 2.41	Greater than 10 CFU per cm ²

Your results:

Sample Area	Lab Result	Conversion	Interpretation

Environmental Sampling Products

Note: the following products are examples of swabs, sponges and contact slides available for environmental sampling. This list is not an endorsement of any particular product. For current pricing contact the company directly.

COMPANY INFORMATION

3M Canada Inc <http://www.3m.com/microbiology>
Contact representative: Nancy Bender Tel: 800-265-1840x 7423
E-mail: nabender@mmm.com
[3M Products: environmental sponges/swabs, residue swabs](#)

Thermofisher Scientific www.oxid.com/ca
Contact representative: Graham Monda Tel: 800.267.6391
e-mail: graham.monda@thermofisher.com

Labplas labplas@labplas.com
Contact representative: Michel Marot Tel: 450.922.6944
e-mail: mmarot@labplas.com

Note: for all products, if a choice of buffer is available recommend the neutralizing buffer for sanitation and hygiene, and either buffered peptone water or letheen broth for pathogen detection.

A. Sponge Products

1. Solar Cult Sponge Handle Sampling System.
The sponge has a handle so gloves are optional. The handle has a hinged quick release to allow the sponge to drop easily into the bag after sampling.
Product code: SH10DE / NSS0085 (Thermofisher Scientific)
2. Solar Cult Pre-moistened sponges
Sterile rehydrated sponge, gloves needed.
Product code: BS15DE / NQS0084 (Thermofisher Scientific)
3. Sani-Stick
The sponge has a handle so gloves are optional. The handle has a hinged quick release to allow the sponge to drop easily into the bag after sampling.
Product code: KSS-61310-NE (Labplas)

B. Swab Products

1. RediSwab. From Med-ox Diagnostics. Sterile swab in tube with buffer.
Neutralizing Buffer: # IBRS-960-10NB
Buffer Peptone Water: #IBRS-960-10BPW
Lethen Broth: #IBRS-960-10LET
2. Copan Sterile Swabs. From Weber Scientific. Sterile swab in tube with buffer.
Two sizes of swabs available: 95 mm # 3664-30 and
150 mm #3664-40

C. Agar Contact Slide Products

1. Hygicult TPC (total plate count). From Med-ox. # OD68010
Nutrient agar (total plate count). From Med-ox # DS146
2. Hychek (total plate count). From BD #29005
Hychek Disinfect (total plate count). From BD #29002

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9. Food Protection Reports November 2006, p 7. Studying Microbial Loads in Food Service Setting