

ENVIRONMENTAL SAMPLING PLAN

A properly established program will act as an early warning system for potential microbial hazards in a meat plant and confirm that sanitary designs, personnel practices, and operational methods already in place are, in fact, effective.

Environmental sampling programs can be used for a number of purposes. The following information is for designing an environmental sampling plan.

Determine What or Where to Sample

The “zone” concept is widely used in Ready to Eat (RTE) meat and poultry plants for environmental monitoring programs; plant operations are divided into zones based on level of risk – Zone 1 being the highest level of risk and Zone 4 being the least. The same concept can be used when performing environmental sampling for sanitation verification in all other meat plants.

Evaluate your plant premises and equipment and categorize each into the following Zones based on the definitions.

Sampling Zone	Definition	Examples of Sample Sites
Zone 1	Food contact surfaces (FCS): any surface or object that comes into direct contact with the product in RTE areas	Conveyor belts and scrapers, tables, holding vats and tanks, utensils, gloves and aprons, pumps, valves, slicers, dicers, filling/packaging machines, transport racks, trays, scales, brine chillers, peeler tables, hoppers
Zone 2	Non-FCS in RTE areas with close proximity to product or FCS	Exterior of food contact equipment, control panels, lubrication points, sides of weigh scales, other areas where potential risk of contamination exists through human or equipment interaction
Zone 3	Non-FCS outside of Zone 1 or Zone 2, but still within the RTE processing area	Floors, walls, refrigeration units, drains, floor mats, doors, floor scrubbers, forklifts, traffic pathways into process area, overhead piping, wash stations, floor cleaning tools
Zone 4	Non-FCS outside RTE processing areas	Production area offices, locker rooms, restrooms, cafeteria, hallways, trash areas, maintenance shops, warehouses, corridors of production areas

Determine Number of Samples

History and trends of results available for microbial environmental monitoring should influence the number of samples collected. If there is no history available the following distribution across zones can be used as a guide to determine appropriate number of samples:

- Zone 1 – 40-60% of sponge/swab samples
- Zone 2 – 20-40% of sponge/swab samples
- Zone 3 – 10-20% of sponge/swab samples
- Zone 4 – 0-10% of sponge/swab samples

To maintain budgets, take the greatest volume of samples within Zone 1 and the least in Zone 4. The percentages can be adjusted as needed on the basis of previous results and observed trends.

Determine Frequency of Testing

Samples should initially be taken once per week for one month prior to cleaning to assess baseline microbial load. Try to sample all zones within a monthly period. Once the baseline has been determined, you can then draw up a schedule with the number of samples and frequency.

Who should Sample?

Swabbing procedures must be conducted aseptically by trained plant personnel using hygienic handling practices (hand sanitizing, wearing gloves, etc.). In general, sampling should proceed from the “cleanest” areas to the “dirtiest” areas to avoid cross-contamination of the plant.

What Method of Sampling Should You Use?

The sampling site should dictate whether sponges or swabs are used. Sponges are preferred for most surfaces to maximize the surface area sampled. Swabs are more appropriate for sampling smaller surfaces and difficult to reach areas (i.e., crevices, screws, slots, cracks, etc.). Generally, a sponge sample should cover 900cm/sq whenever possible, and a swab sample should represent a 10cm x 10cm (100cm/sq) area, or the entire area for crevices, slots, etc.

Sampling Procedure

1. Ensure that all equipment is turned off and/or appropriate lock-out procedures are in place before starting to swab.
2. Remove the swab/sponge from its container/bag aseptically.
3. Rub the swab/sponge over a 10cm x 10cm surface firmly and thoroughly. Rub 5 times from the bottom to the top and 5 times from side to side on the surface. If using a swab rotate the swab between thumb and finger during this process to use the entire tip area. If using a sponge turn over during this process. Some equipment or surfaces do not accommodate a 10cm x 10cm surface but are swabbed/sponged using an estimate so that the total surface swabbed will be 100cm/sq.
4. Carefully return the swab/sponge to its labeled container/bag ensuring not to touch any part of the swab or stick.
5. Swabs must be kept refrigerated until plated if tested internally or shipped to an external lab.

Sample Shipping

Samples should be shipped to an accredited laboratory on the same calendar day as collected. A list of accredited labs can be found on the Standards Council of Canada’s website at: <https://www.scc.ca/en/search/palcan>.

Samples should be shipped by means of a pre-chilled shipping container containing sufficient frozen gel packs to maintain refrigeration conditions. Samples must not be frozen and must be analyzed no later than the day after collection.

Procedures to Ship Samples

1. Store at 4°C after collection and during transport to laboratory.
2. Complete the sample submission form that you would have received from the laboratory.
3. Testing **MUST** begin within 36 hours after sampling.
4. If samples are to be shipped use coolers with ice packs. Dry ice and wet ice are not recommended.

Evaluation of Results

1. Data should be reviewed as soon as practical after receipt from the laboratory.
2. Positive results should lead to investigation and corrective actions. Positive results are not a bad thing – you want to find where the problem areas are and take action.
3. One way of finding repeat problem areas or a potential source of contamination is to map positive results on a plant schematic/layout. Clusters of positives indicate a problem area that needs focused attention.
4. The data should be reviewed on a regular basis, looking for trends or patterns. The frequency and depth of review will depend on the facility.

For more information, resources, or help with your program please contact:

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