

## **DEFINITION OF TERMS**

The following information is applicable to all microbiological methods that detect bacteria in food, ingredients, and environmental samples (food surfaces). It is taken directly from the Appendixes A and B of the Compendium of Analytical methods published by Health Canada that deal specifically with sampling definitions, collection and transportation of samples. It is intended to all those involved in doing the sampling and shipping of the samples to Capella Innovation laboratory.

Lot: A batch or production unit which may be identified by the same code. When there is no code identification, a lot may be considered as

(a) that quantity of product produced under essentially the same conditions, at the same establishment and representing no more than one day's production; or,

(b) the quantity of the same kind of product from one and the same manufacturer available for sampling at a fixed location.

Sample: The total number of sample units taken per lot for analysis. The number of sample units taken is usually between 5 and 60 drawn at random from each lot.

Sample Unit: Usually a consumer size container of the product and should consist of a minimum of 100 g (mL), unless stipulated in the method, or requested in the specific commodity sampling plan.

Each sample unit may consist of more than one container in order to meet the size specifications of the sampling plan.

Analytical Unit: That amount of product withdrawn from each of the sample units (that constitute the sample) for analysis. The analytical units may be tested individually or composited as directed in specific methods or sampling plans.

## **COLLECTION AND TRANSPORTATION OF SAMPLES**

A sample, consisting of a specified number of sample units (usually between 5 and 60) drawn at random from each lot, shall be taken. The number of sample units is determined using Health Canada guidelines and depends on the pathogen being investigated, the type of food being tested, and the methods being used to detect and confirm the presence of the pathogen.

Each sample unit shall consist of at least 100 mL or grams, unless stipulated in the method or requested in the specific commodity sampling plan. Collect from the original unopened container wherever possible.

If the product is in bulk, several sample units can be collected from one container, while ensuring that the total number of sample units are not collected from one single container. More than one sample unit may also be collected from large institutional or

bulk containers when the total number of sample units required exceeds the number of containers in the lot. Place the collected sample units in sterile containers. A sample unit will consist of more than one container when the lot consists of containers smaller than the minimum requested size (often 100 mL or g), for example four 25 mL or g containers in each sample unit. Always employ aseptic techniques in collecting the sample units.

Keep the sample unit refrigerated or frozen, depending on the nature of the product, during transport. Shelf stable products (e.g. canned products) may be transported at room temperature. Fresh fruits and vegetables are often sold at ambient temperatures in public markets, however they should be sent at refrigeration temperatures (1°C to 4°C) to keep the microflora as close as possible to the “state” of the sample presented to the consumer at the time of purchase (avoiding overgrowth of mesophilic bacteria that may hinder the detection of the targeted pathogen).

Do not allow sample units, that are usually frozen (e.g. Ice cream), to thaw during shipment.

### **How to sample food**

It is important to practice proper sampling techniques to avoid contaminating samples and exposing yourself to contaminants.

- Wear protective items, such as gloves and protective clothing.
- Use only clean equipment and containers to take samples.

Samples should be labelled with the information you need to link the results back to the food, ingredient or food contact surface being assessed. Sample labels should include:

- date and time of collection
- description of what was sampled
- lot number
- sampling site
- name of the person who collected the sample

The sample units should be representative of the lot and obtained randomly:

- each sample unit should be selected by chance and each unit in the lot should have an equal chance of being included in the sample.
- you can use a table of random number generated using a computer software to assign a number to each unit in a lot and select units to be sampled

### **Collecting ingredient and food samples**

When collecting samples:

- wash and dry hands prior to sampling
- use aseptic techniques when taking microbiological samples

- pre-packaged food samples should be collected in an original, unopened package
- use appropriate sampling containers that can withstand handling and shipping
- securely seal sample containers after filling so they cannot leak or become contaminated during further handling or transportation
- Note: Open, broken or damaged containers are not appropriate for sampling

### **Using aseptic techniques**

When collecting samples for microbial testing avoid introducing microorganisms to the samples by following aseptic sampling procedures:

- Use only sterile equipment and containers, and properly re-sterilize sampling tools before using them again
- Make contact with the source material and the sample only with the sampling tool or the container
- Use sterile gloves if a sample must be touched with the hands. An aseptic sample should not be touched with bare hands
- Minimize exposure of the product, sampling equipment, and the interior of sampling containers to the environment. For example, avoid collecting samples in areas where dust or atmospheric conditions may contaminate the sample unless such contamination may be considered part of the sample
- Work rapidly. open sterile sampling containers only to insert the sample, and close them immediately
- Avoid unnecessary contact. The sample and sampling tool should not contact the interior, lip, or lid of the sterile container

### **Quick tip**

Take care when opening and closing sample containers. It is easy to contaminate a sample during this step!

There are many things that you can do to reduce the risk of contaminating your sample. The following points are things to consider when sampling.

### **Opening sample containers**

- For a bottle or cup: remove the cap or lid with a free hand and keep it in that hand during sample collection; only the exterior of the cap or lid can be touched
- For a bag: open the bag by using the tabs. Do not touch the opening of the bag
- Do not overfill the sampling container

### **Closing sample containers**

- For a bottle or cup: replace the cap or lid on the container without touching the inside of the cap or the mouth of the bottle and secure the cap or lid
- For a bag: pull twist ties tight, whirl the bag three revolutions, and fold the twist ties towards each other to seal the bag
- Securely seal sample containers after filling so they cannot leak or become contaminated during further handling or transportation

## **Storing and shipping samples**

Samples for microbial testing can be compromised by the temperature they are exposed to and the time that goes by before they are tested. To preserve their integrity, you should store and ship the samples at appropriate temperatures and within the time frames recommended by the laboratory.

To prevent contamination, deterioration, and other damage that could compromise the integrity of a sample during transportation:

- before shipping, store samples in a manner to maintain their integrity
- measure and record temperature of sample units before placing them into the shipping container
- use sound, clean, dry shipping containers, coolers, coolant and packaging materials
- Pack samples tightly to prevent shifting
- transport frozen or refrigerated samples in an insulated shipping container of rigid construction and packed with suitable coolant material to maintain their frozen or refrigerated state. Avoiding direct contact with the coolant material
- ship samples collected as quickly as possible

## **What to do with the results**

Satisfactory results provide evidence that your control measures are effective. Unsatisfactory results however, indicate that your control measures are not effective. You are responsible for the safety of the foods you prepare and need to take action when you obtain results that indicate a food safety situation or that your control measures are not effective.