



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Canadian Food Inspection Agency



Our vision:

To excel as a science-based regulator, trusted and respected by Canadians and the international community.

Our mission:

Dedicated to safeguarding food, animals and plants, which enhances the health and well-being of Canada's people, environment and economy.

Microbiological Sampling

Enrico Buenaventura

Food Safety Division

Food Safety & Consumer Protection Directorate

Canada

The Agenda

- Introduction
- Basic Principles
- Sample Information
- Aseptic Techniques



Introduction

- Highlight of One Day Microbiological Sampling workshop
 - Environmental
 - Food
- Hands-on (Wet lab)
- Lecture
- Videos



Overview of Microbial Pathogens in foods*

Microbial pathogens present in foods may lead to **infections** and/or may produce toxic compounds that persist in foods (**intoxications**).

*Donald w. Schaffner (ed). (2008). Microbial Risk Analysis of Foods. Washington, D.C.: ASM Press.



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Overview of Microbial Pathogens in foods*

Microbial pathogens are for the most part living things and susceptible to environmental conditions in foods.

Safer food is essentially achieved by:

- **preventing** pathogens from getting into or onto foods
- **removing** pathogens from foods (e.g. filtration)
- **inactivating** pathogens, if present, in foods (e.g. heat, chemical tx)
- **minimizing** growth, if present (e.g., refrigeration or with chemical preservatives)

*Donald w. Schaffner (ed). (2008). Microbial Risk Analysis of Foods. Washington, D.C.: ASM Press.

Microbiological Sampling

Aseptic Techniques

Aseptic Technique*

- consist of taking a clean specimen without cross contaminating the sample or the areas surrounding the surface areas
- it is important to use aseptic techniques in packaging the sample for transport

*Peter Emmanuel, Jason W. Roos, Kakoli Niyogi (eds). (2008). Sampling for Biological Agents in the Environment. Washington, D.C.: ASM Press.



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Microbiological Sampling

Fate of pathogens in foods are affected by environmental factors:

- **ABIOTIC (Non-living)**

- Temperature, Levels of oxygen and other gases, osmotic pressure (e.g. addition of solutes), acidity, nutrient levels, preservatives (e.g. nitrites, organic acids)

- **BIOTIC**

- Competition for resources, production of inhibitory compounds

Microbiological Sampling

Cross contamination

- Compete for nutrients
- Outgrow target organism (**masking**)
- Produce inhibitors to destroy target
- Inhibit detection of target organism (**interference**) - false low prevalence of target
- Spread of target organism to other sub-samples - false high prevalence
- Introduce chemical inhibitors in sample (e.g., disinfectants)

Microbiological Sampling

Temperature- Chilling/Freezing

- Damage/injure cells in food (fruits & veg) resulting in inhibitors;
 - Cultural inhibitors
 - PCR inhibitors
- Interfere with detection
 - **induce VNBC** = viable but not culturable
 - Destroy target
 - Inactivate target - destroy surface antigens
 - Lower levels of target below detection limits



Microbiological Sampling

Time to analysis - shipping

- Poor nutrient food (e.g. water) will result in substantial decrease in indicators over time
- Change in microbial population during extended transport
- Autolysis in high acidic conditions
- Spoilage in non-shelf stable food
- Excessive growth during transport



The Agenda

- Introduction
- Basic Principles
- **Sample Information**
 - Obtain the appropriate sample info
- Aseptic Techniques



Microbiological Sampling

Sample Information

- Tombstone information that establishes sample identity and lot identity
- Product information that ensures traceability
- Product information that allows the laboratory analyst to determine the appropriate analysis to be performed



Microbiological Sampling

Sample Information

- Sample information that establishes location of the sampling point as well as the sequence of sampling performed
- Sample information that establishes the condition of product at time of sampling (e.g. temp) and the manner by which the product is offered for sale (e.g. retail)
- Sample information that accurately reflects what was sampled - inline vs. final product

Examples of Information Available on Pallets



**Pallet code:
Identifies packing
house/cooling facility**



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Examples of Information available on Master Containers



Name and Address of the Responsible Party

Lot code stickers (harvest date, farm location, harvesting/packing crew)

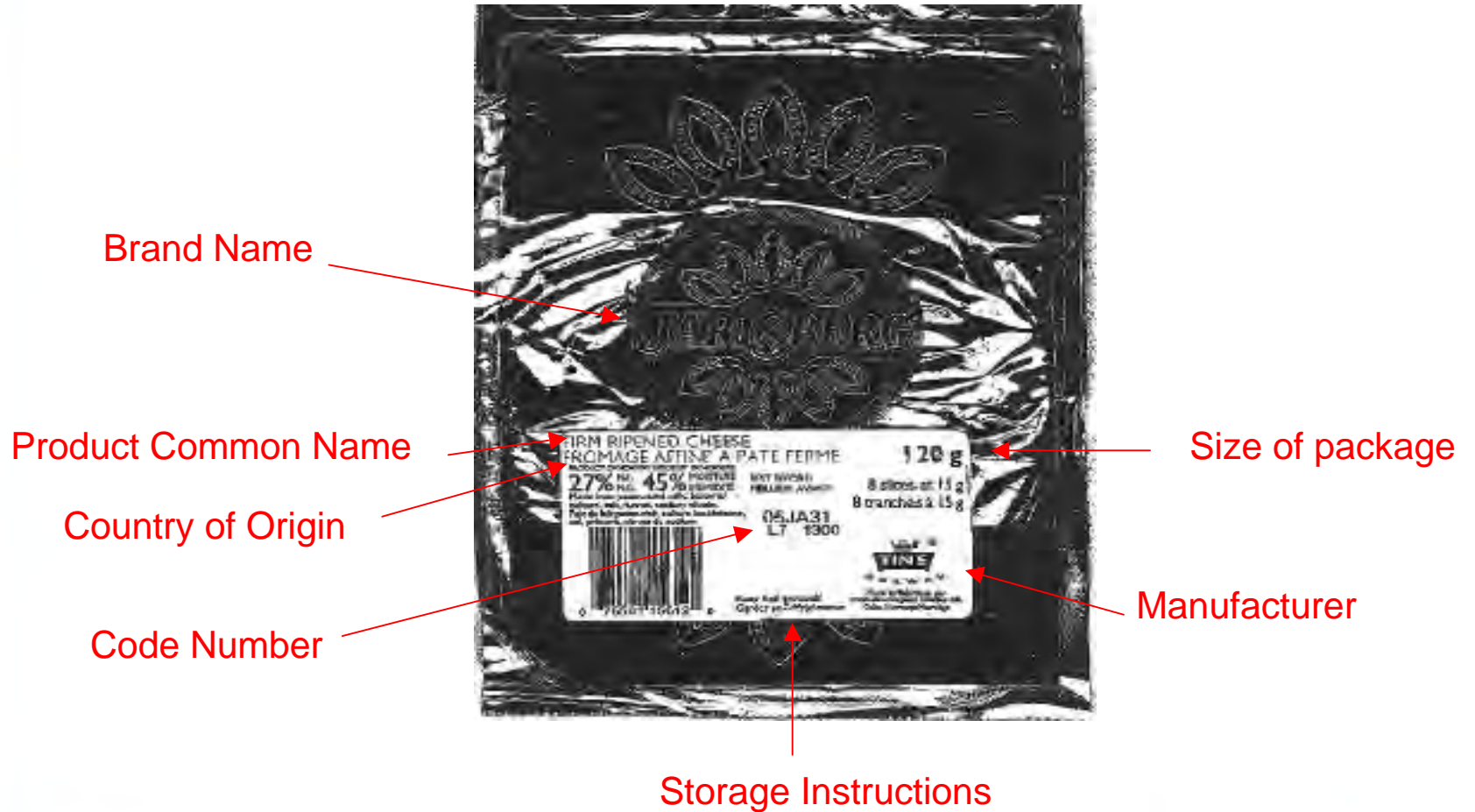


Examples of Information available on product labels/stickers



The Package

Sampled at: Fancy Foods
Date Sampled: June 30, 2005



The Package

Sampled at: Establishment # 1422
Date Sampled: April 3, 2005

Code - On bottom of container

Oct 5 2005

142 9P1 15:18 5431500



The Package

Storage Requirements



Brand

Common Name

Net Contents

Code

Product Of

Registration #



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Harvest tag-Clams

Area 14-8 in BC, Lease#101625

Pacific Northwest Shellfish Co. Ltd.
150-8851 Beckwith Road, Richmond, B.C., Canada V6X 1V4
Tel: (604) 244-9936 Fax: (604) 244-9937 BC740SP

ORIGINAL SHIPPER'S CERT. No. IF OTHER THAN ABOVE:	BC740SP
HARVEST DATE: 07-May-09	SHIPPING DATE: 07-May-09
HARVEST LOCATION: BC 14-8, #101625	
TYPE OF SHELLFISH: FRESH MANILA CLAMS	FARM RAISED
QUANTITY OF SHELLFISH:	
<u>25 LBS</u> POUNDS	COUNT
_____ KILOS	OTHER

THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY OR IS RETAGGED AND THEREAFTER KEPT ON FILE FOR 90 DAYS.

TO: PACIFIC NW SHELLFISH	RESHIPPER'S CERT. No.	DATES RESHIPPED
	LOT #	

Harvest-tag Oysters

Fresh Pacific Oysters
XS = extra small

Pacific Northwest Shellfish Co. Ltd.
150-8851 Beckwith Road, Richmond, B.C., Canada V6X 1V4
Tel: (604) 244-9936 Fax: (604) 244-9937

BC740SP

ORIGINAL SHIPPER'S CERT. No. IF OTHER THAN ABOVE: BC740SP

HARVEST DATE: 07-MAY-09 SHIPPING DATE: 07-MAY-09

HARVEST LOCATION: BC 14-8 #101825

TYPE OF SHELLFISH: FRESH PACIFIC OYSTER XS/SMM/L FARM RAISED

QUANTITY OF SHELLFISH:

_____	POUNDS	<u>10 DZ</u>	COUNT
_____	KILOS		OTHER

THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY OR IS RETAGGED AND THEREAFTER KEPT ON FILE FOR 90 DAYS.

TO: PACIFIC NW SHELLFISH	RESHIPPER'S CERT. No.	DATES RESHIPPED
	_____	_____
	LOT #	_____



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Harvest tag-back



The Agenda

- Introduction
- Basic Principles
- Sample Information
- **Aseptic Techniques**
 - For use in Microbiological sampling
 - Environmental
 - Food - liquid, bulk food, frozen food, etc.



Microbiological Sampling

1. Planning - Prepare a Plan
2. Sampling - Execute the Plan
3. Preparing the Sample for Storage and/or Transportation





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Swabbing
Technique

Technique
d'échantillonnage

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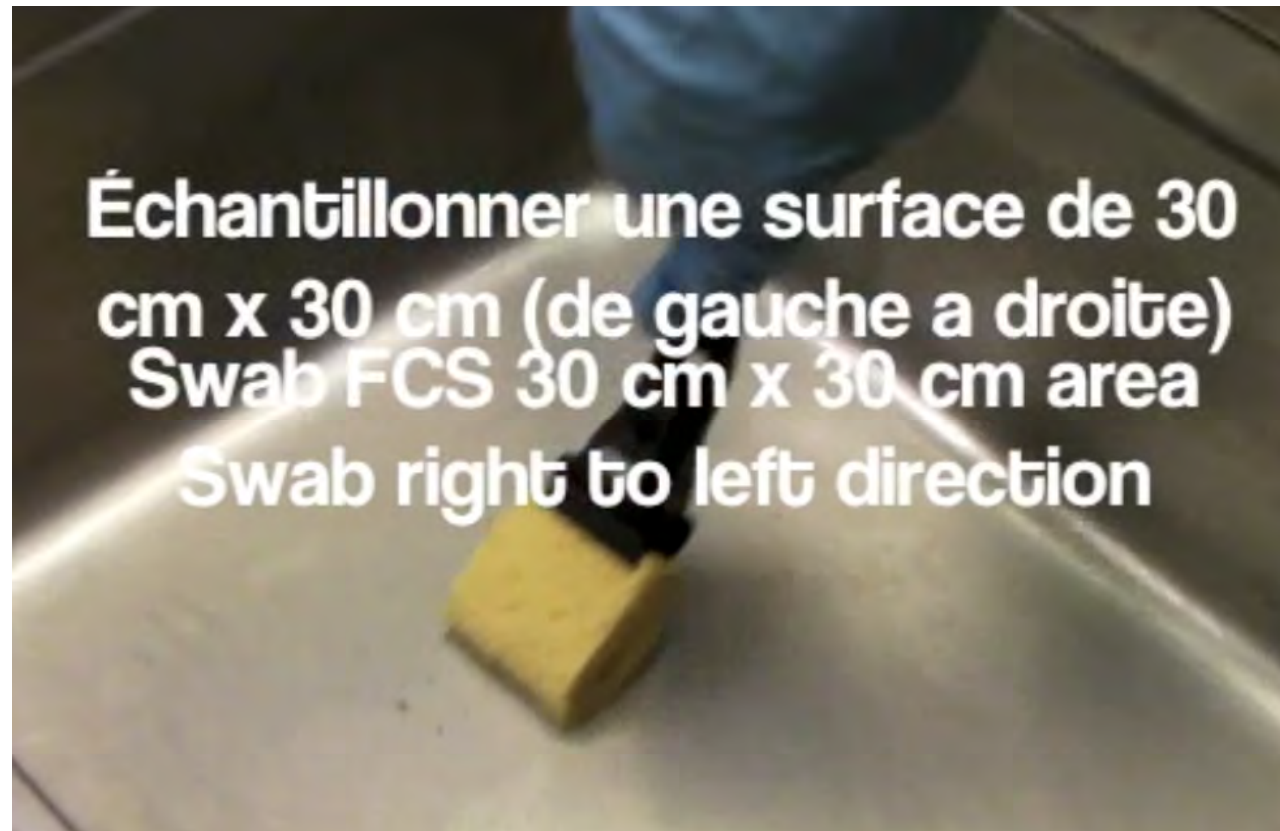
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Video 1:48 (mm:ss)





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Sampling Échantillonnage Frozen de boeuf haché Ground Beef congelé

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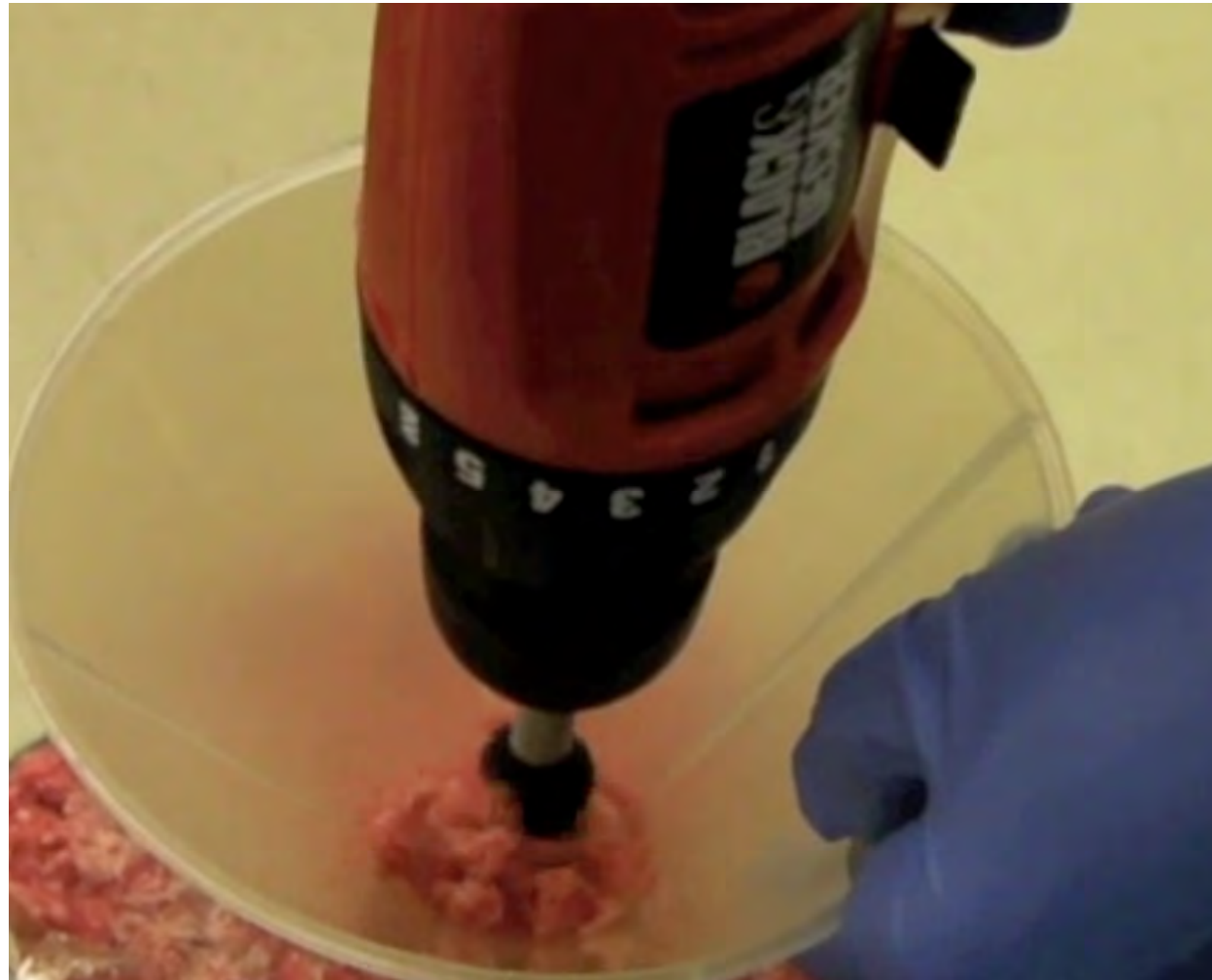


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Video 1:57 (mm:ss)



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Sampling Échantillonnage Fruits & de fruits et Vegetables légumes

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Video 0:42 (mm:ss)



Merci de votre attention
Thank you for your attention

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microevaluation@inspection.gc.ca