

Food Sampling – A Guide for Businesses

The Food Safety Act, 1990 states that it is an offence for any food premises to sell food that is;

- unfit for human consumption.
- so contaminated that it would not be reasonable to expect it to be used for human consumption.
- is not of the nature, substance or quality demanded by the purchaser, or is falsely advertised.

It is the job of Blackpool Council's Food Group to ensure that food sold within the town is safe to eat, meets legal compositional requirements and is not falsely described. The routine sampling of food for microbiological examination is an essential element of this function.

The aim of this leaflet is to explain why we take food samples, what kind of microorganisms we look for, and how to interpret the results of food that has been tested.

Why do we sample certain foods?

The Quality Standards Food Group participates in a range of local and national food sampling surveys in co-operation with other authorities in the Lancashire and North West area, and also with bodies such as the Food Standards Agency (FSA) and the Local Authorities Co-ordinating Office on Regulatory Services (LACORS). In addition, we also sample foods that officers identify during their routine food hygiene inspections as being particularly high risk, or where we have concerns about how food is produced and prepared.

How are samples taken?

Food samples are always taken in accordance with prepared protocols and under guidelines set out in the Food Safety Act codes of practice for sampling.

Occasionally food samples are purchased 'under cover'; i.e. over the counter in the same way as a member of the public would buy them. This is so we can test standards at the point of sale. On other occasions sampling officers will make themselves known to the person selling food, particularly when we need to sample one part of a food product before other ingredients are added. For example, we may want to examine a sandwich filling before it has been subjected to handling during the sandwich making process.

Once the sampling officer has taken a food sample from your premises it is transported under temperature-controlled conditions to an approved laboratory within four hours.

The sampling officer should be able to answer any questions you may have about why a food sample(s) has been taken from your business premises.

Laboratory analysis and microbiological standards

On arrival at the laboratory food samples will be tested for a range of different types of bacterial micro organisms, the presence and/or quantity of which will be used to judge the quality and safety of a food. Certain foods are required by law to meet prescribed microbiological criteria, established by the Public Health Laboratory Service, that give guidance to food enforcing authorities as to whether or not a given set of results are acceptable or likely to constitute a risk to health. Details of these guidelines are set out and discussed later in this leaflet.

Microbiological Specifications

These are criteria which a manufacturer or retailer may demand as a 'condition of acceptance' from their retailer. These standards are agreed between the two parties and do not involve any regulatory agencies.

Microbiological guidelines for ready-to-eat foods

The type of microorganisms that the laboratory will look for in a sample depends on the food that is being tested and how it is produced. There are several different tests used for ready-to-eat foods and these are outlined below.

Aerobic colony count: This is a count of bacteria and includes those that occur naturally in most foods and others present as a result of contamination. The bacterial count increases significantly over time in response to poor product temperature control. The count is used to indicate quality and keeping potential (freshness) of the product.

Indicator organisms: These are organisms that, although not harmful in themselves, indicate unhygienic processing procedures or post preparation contamination when high levels are detected in ready-to-eat foods. Post process contamination may be from staff, dirty kitchen equipment or packaging, and airborne particulates as a result of unprotected environmental exposure.

Enterobacteriaceae is a family of microorganisms that live in the intestines of man and animals. Included in this family is a bacteria known as *E.coli*, a strain of which, *E.coli* 0157, is harmful and can cause severe illness in humans.

Listeria species can also be found in the intestines of animals and are widespread in the environment.

All these organisms in food are used as an indication of faecal contamination (via hands, bird droppings, infected water, contaminated ingredients or equipment). Pathogens (see below) are bacteria that are capable of causing illnesses such as food poisoning and gastro-enteritis following gastrointestinal infection in man and animals. Thus, if indicator organisms are found in food samples it also suggests that pathogenic bacteria may also be present.

Pathogens: These are organisms that are capable of causing illnesses such as food poisoning. They include bacteria such as *Salmonella*, *Campylobacter*, *E.coli* 0157, *Clostridium perfringens*, *Clostridium botulinum*, *Staphylococcus aureus*, *Bacillus cereus* and *Listeria monocytogenes*. All food samples will be tested for the presence of one or all of these bacteria.

Based on the results of laboratory tests, ready-to-eat food will be classified into one of the following categories – ‘satisfactory’, ‘acceptable’, ‘unsatisfactory’, or ‘unacceptable/potentially hazardous’. (See table 1)

Table 1

Satisfactory	Good microbiological quality
Acceptable	Borderline limit of microbiological quality
Unsatisfactory	Further sampling may be necessary and officers may undertake further inspection of the premises to check if hygiene practices are adequate
Unacceptable/potentially hazardous	Urgent attention is required to locate the source of the problem. Such results may form the basis of prosecutions when they occur in more than one sample

In order to determine the microbiological quality of a particular food sample it is first allocated into one of five categories. (See table 2)

Table 2 – Colony count categories for different types of ready-to-eat foods

Food Group: Meat	Category
Beef burgers, meat pies, pork pies, sausage roll, scotch egg	1
Faggots, kebabs, meat meals (shepherd’s pies, casseroles, unsliced poultry, sausages (British)	2
Sliced meat (beef haslet, pork, poultry)	3
Brawn, sliced meat (cooked ham, tongue), tripe and other offal	4
Ham – raw (Parma/country style), salami and fermented meat products, sausages (smoked)	5

Food Group: Seafood	Category
Herring/roll mop and other raw pickled fish	1
Crustaceans (crab, lobster, prawns), other cooked fish, seafood meals	3
Molluscs and other shellfish (cooked), smoked fish, taramasalata	4

Food Group: Desserts	Category
Mousse/dessert	1
Cakes, pastries, slices and desserts without cream, tarts, flans and pies	2
Cakes, pastries, slices and desserts with dairy cream, trifle	3

Food Group: Savoury	Category
Bhaji (onion, spinach, vegetable)	1
Cheese-based bakery product, flan/quiche, mayonnaise/dressings, samosa	2
Pate (meat, seafood, vegetable), stay, spring rolls	3
Homous, tzatzik and other dips	4
Bean, curd, fermented foods	5

Food Group: Vegetable	Category
Vegetables and vegetable meals (cooked)	2
Coleslaw, dried fruit and vegetables, rice	3
Prepared mixed salads and crudities	4
Fresh fruit and vegetables	5

Food Group: Dairy	Category
Ice-cream, non-dairy milk shakes, ice lollies, slush, sorbet	2
Cheese. Yoghurt/frozen yoghurt	5

Food Group: Ready-to-eat meals	Category
Pizza, pasta and other meals	2

Food Group: Sandwiches & filled rolls	Category
Without salad	4
With salad, with cheese	5

Table 3 (below) is then used to determine the quality of a sample.

Table 3 – Guidelines for the microbiological quality of various ready-to-eat-foods

Criterion	Food category (see table 2)	Microbiological quality (cfu/gram unless stated)			
		Satisfactory	Acceptable	Unsatisfactory	Unacceptable potentially hazardous
Aerobic colony count	1	<10 ³	10 ³ to <10 ⁴	≥10 ⁴	N/A
	2	<10 ⁴	10 ⁴ to <10 ⁵	≥10 ⁵	N/A
	3	<10 ⁵	10 ⁵ to <10 ⁶	≥10 ⁶	N/A
	4	<10 ⁶	10 ⁶ to <10 ⁷	≥10 ⁷	N/A
	5	N/A	N/A	N/A	N/A
Indicator organisms					
Enterobacteriaceae	1 to 5	<100	100 to <10 ⁴	≥10 ⁴	N/A
E.coli & Listeria	1 to 5	<20	20 to 100	≥100	N/A
Pathogens					
Salmonella Campylobacter E.coli 0157 Vibrio cholerae	1 to 5	Not detected in 25g			Detected in 25g
V.parahaemolyticus	1 to 5	<20	20 to 100	100 to ,10 ³	>10 ³
L. monocytogenes	1 to 5	<20	20 to <100	N/A	≥100
S.aureus C.perfringens	1 to 5	<20	20 to <100	100 to <10 ⁴	>10 ⁴
B.cereus & other Pathogenic bacilli	1 to 5	<10 ³	10 ³ to <10 ⁴	10 ⁴ to <10 ⁵	≥10 ⁵

Tables 1 to 3 above are taken from the Public Health Laboratory Service Guidelines for the microbiological quality of some ready-to-eat foods sampled at the point of sale. PHLS ACFDP Working Group. Communicable Diseases and Public Health, September 2000. Vol 3. Number 3: 163 – 167.

Key

≥ equal to or greater than < less than > greater than

If we send you a sample result it may well be written something like this:

Aerobic colony count: 2.8 x 10000 or 2.8 x 10+E4 both mean 28000

This figure is cfu/gram, a microbiological term which means the number of colony forming units that have been counted in one gram of the food sample.

If you refer to table 3, you will see that an aerobic colony count of 10 would be considered as 'unsatisfactory' for a food in category 1, whereas it would be deemed 'acceptable' for a food that falls within category 2 and 'unsatisfactory' for category 3 and 4 foods.

How can I improve the quality and safety of the food I sell?

Are you handling food properly at every stage from delivery to point of sale? Does the way you handle food avoid contamination? Do you keep food in conditions that inhibit the growth of bacteria? Try asking yourself these and the following questions and see if there is anything else you could be doing to improve the microbiological quality of the food you sell.

- **Delivery**

Are you checking temperatures, date codes and condition of packaging and storage?

- **Storage**

Are you checking fridge and freezer temperatures? Do you have an efficient stock rotation system? Are products kept covered and stored in a way that prevents contamination of any kind?

- **Preparation**

Do staff understand and practice good personal hygiene? Are your products prepared in a way that avoids contact with potentially contaminated equipment and raw foods? Is equipment cleaned often enough and with the correct cleaning materials?

- **Cooking**

Are the products cooked for the correct amount of time at the correct temperature? Are temperatures checked using a probe thermometer?

- **Cooling**

Are products cooled in an area free from contamination? Are products cooled within 1½ hours?

- **Display**

Do your staff wash their hands after handling raw foods? Are separate utensils and cutting boards used when handling cooked meat? Are your products covered with food grade quality wrapping to prevent environmental contamination?

- **Training**

Are all your staff properly trained? Do your staff report illness to you.