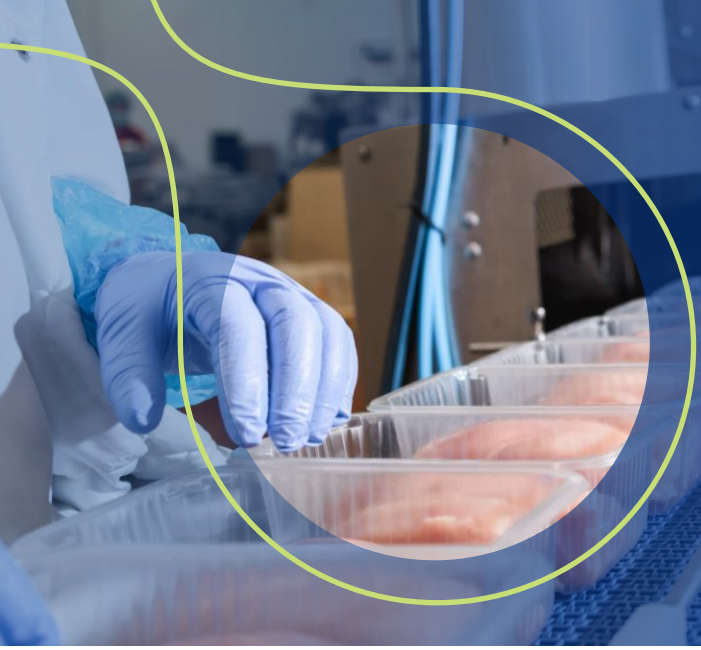

Monitoring Microbiological Air Quality Guidance

In food production environments

Air sampling in microbiology is the process of collecting and measuring microorganisms present in the air to assess hygiene, contamination risk, or environmental control.

Why carry out air sampling in a food production environment?

Air sampling tests are designed to answer the question "*to what levels and types of contamination is the food exposed from the air in the room during production?*" and can be used to assess the effectiveness of air handling (filtration and flow control) systems, and the microbiological quality of outputs from air conditioning systems. Even where no air filtration or conditioning units are present, there may situations where it is appropriate to verify the microbiological quality of the air, e.g., in spiral chilling.

Note that where the temperature is below freezing, this will freeze any agar and render agar plates useless.

Sampling techniques

Air 'settle' plates

Use of air settle plates is known as passive air sampling; agar plates of an appropriate culture medium are placed on a surface in the food production environment, and the lid removed to expose the agar for a specified amount of time. Microorganisms in the surrounding air will settle out on to the surface of exposed agar.

The result is expressed as CFU (colony forming units) / plate / time.

Air sampling devices

Air sampling using devices is known as active sampling. A number of microbiological air sampling devices are commercially available. These draw a known volume of air through, or over a particle collection device which can be liquid or solid culture media or a nitrocellulose membrane.

The result is expressed as CFU / m^3 of air.

Agar plates and exposure times

Which microorganisms?

Which organisms are tested for should be decided based on knowledge of the microflora of the environment, and potential impact on the safety or quality of the food.

Typical tests carried out are for Total Viable Counts (TVC) and / or Yeasts & Moulds. The culture media used should be appropriate for the target organisms.

Agar plate exposure time

Typically, agar plate exposure time is for between 15 and 60 minutes. Longer exposure should not be required and may result in the surface of the agar becoming overly dried and producing a misleadingly low result.

Acceptable limits

Microbiological criteria

Microbiological pass / fail criteria should be set on a case-by-case basis. Targets should normally reflect what is achievable in the production environment when it is in good hygienic condition (i.e., clean), with any air-handling equipment and ventilation systems fully functional, and should take account of the expected impact on product quality or safety.

The exception to the above is where it has been established that the existing conditions in the facility, even directly after cleaning, are not conducive to acceptable quality of product, e.g., visible mould growth in product within shelf-life due to mould colonisation of air handling equipment.

Examples of microbiological criteria

A pass/fail criterion for TVC in an environment where air quality is highly controlled (clean-room like) could be ≤ 1 cfu / plate / minute (≤ 15 cfu / plate / 15 minutes),

whereas,

In a modern packaging hall with positive pressure air handling a typical criterion could be ≤250 cfu / plate / 15 minutes.

We're here to help

Eurofins Food Testing UK is supported by experienced, highly trained professionals who understand the importance of a reliable and accurate testing partner.

Our teams support the food industry with trusted microbiological and testing and consultancy services, helping to ensure the safety and quality of products across a wide range of food types and processing environments.

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