

Food Microbiological Challenge Testing Guidance

Microbiological challenge tests are experiments to investigate the ability of microorganisms of concern to grow or survive in the food product following processing, or under reasonably foreseeable conditions of distribution and storage.

A key feature of challenge tests is that live microorganisms are deliberately added to the food. The product is then monitored to see if the organism grows, survives, or dies off.

An advantage of microbiological challenge testing is that it can be carried out on a food manufacturer's own product, and the experimental design can be tailored to address the specific concerns and conditions under investigation.

Challenge tests may take the form of growth potential testing. This determines whether the food supports growth of the challenge microorganism.

In products which support the growth of the challenge microorganism, growth rate testing evaluates how both intrinsic and extrinsic control factors affect microbial growth over time.

Where the challenge microorganism may be killed-off under specific conditions, an inactivation study can be carried out.

Challenge testing is commonly applied to pathogens such as *Listeria monocytogenes*, *Bacillus cereus*, and

Staphylococcus aureus, as well as spoilage organisms like lactic acid bacteria, moulds, and yeasts. It can therefore be valuable in addressing both food safety and microbiological quality.

The results can provide critical insight into whether the food remains safe, acceptable, and within regulatory limits.

Applications of challenge testing include:

- Establishment or justification of food product shelf-life
- Evaluation or comparison of product formulations
- Assessment of spoilage potential

This specialist testing requires a comprehensive pre-assessment, lots of laboratory resources, and often many samples. It can be valuable where other approaches cannot provide the answers.

It is not recommended where answers can be obtained more easily, faster, and at a lower cost. Our food safety experts can provide guidance on the best approach for your business.



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