Guidance for the compositing of seafood products and environmental samples for microbiological testing

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This guidance is intended to assist seafood operators with the sampling and microbiological testing of seafood products and the environment, and when it is appropriate to composite samples, e.g. for Salmonella, Listeria monocytogenes and histamine.

The guidelines are applicable to all seafood operators under the Animal Products Act 1999 (APA) and the Food Act 1981 producing product for the New Zealand\(^1\) market. In addition, operators must also meet all the other requirements of the Food Standards Code (FSC) (e.g. Standard 1.6.1 Microbiological Limits for Food).

What is a sample?

- A “sample” is a small part or quantity that when tested is deemed to represent the lot as a whole. A sample may be from a seafood product or from an environmental swab(s).

What is the compositing of samples?

- Compositing is the amalgamation of a number of samples from the same lot/batch to produce a single ‘final sample’ or ‘test portion’ for microbiological or chemical testing.

- A number of environmental swabs from the same zone in a ready-to-eat seafood business, e.g. zone 1, zone 2, etc, may also be amalgamated to form a composite sample for Listeria spp. or Listeria monocytogenes testing.

When is compositing appropriate?

- Compositing is appropriate if the number of samples required to assess the microbiological or chemical quality of a lot/batch is prohibitively large in terms of laboratory resource or cost, and the power of the decision is not lessened by compositing.

- Compositing of samples is appropriate only for qualitative analyses, i.e. presence/absence tests. Compositing is not appropriate for quantitative tests.

\(^1\) Operators producing seafood products for overseas markets should check the overseas market access requirements to determine whether the compositing of samples is permitted.
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- Compositing of samples is appropriate only if the whole composite is tested. The analytical sample cannot be a sub-sample of the composite.

Which microbiological tests are appropriate for the compositing of the samples?

- Qualitative (presence/absence) microbiological tests (product or environmental) often described as 2-class sampling plans and represented by parameters of \( n=5 \) and \( c=0 \).

- *Salmonella, Listeria spp. and L. monocytogenes.*

Are there a maximum number of samples that can be composited?

- The maximum number of samples composited may be specified in the regulatory or private standards or guidelines against which the test result will be judged; e.g. five samples, where five samples are specified for domestic assurance programmes. Typically a single composite sample is formed from 5 samples of 25g to produce a final sample of 125g.

- If not stated, the maximum number of samples that may be composited is 15, as stated by the American Public Health Association (APHA). A lesser number may be specified by the laboratory depending on suspension volume and equipment capacity.

Are there any types of products or situations where compositing of samples is not appropriate?

- Compositing of samples is not appropriate for Norovirus testing of shellfish from growing areas.

- Compositing of samples may not be appropriate for investigative or exploratory sampling when routine environmental monitoring has detected *L. monocytogenes* on a zone 4 / food-contact surface sites, i.e. when trying to identify a contamination source.

- Compositing of samples is not appropriate for quantitative tests.

Where should the compositing of samples take place?

- Compositing of swab samples may occur as collected.

- Compositing of product samples should occur in the laboratory to enable verification of equal proportion. Product or samples should be submitted to the laboratory either:
  - in the original unopened container or packaging, or
– as separate samples. Samples should be collected aseptically by appropriately trained samplers and transported in sterile, labelled, containers to ensure maintenance of integrity of the sample.

• Where compositing must occur at the premises, the operator must send the entire final composite sample to the laboratory, irrespective of final analytical sample size/weight, unless otherwise informed by the laboratory.

**What are the limitations to the use of composite samples?**

• The testing of composite samples may reduce the sensitivity of the analytical method at very low levels of contamination such that a potentially positive result is missed.