



NQAC

Nestlé Quality Assurance Center
Dublin

COMPOSITING (POOLING) MICRO SAMPLES

The act of “compositing” or “pooling” samples for microbiology methods refers to taking a submission of multiple samples and pulling a representative amount from each, combining them into one. The benefit of this is running and being charged for a single test instead of many.

NQAC Dublin follows the ISO 17025 definition of pooling, that being:

“Mixture of test portions from a number of the same items of food, animal feed, animals or environment, where the complete mixture is the test portion examined”.

Qualitative methods

From both internal and external validations our data shows that pooling portions of samples for one test is acceptable when all contributing portions come from the same food item (ie. Ice cream with ice cream, infant formula with infant formula etc.) and the media to product dilution ratio can be maintained (10 g of product to 1 L of media). This is illustrated in the below table.

| Microorganism | Max Pooling weight | Max enrichment |
|--------------------|--------------------|----------------|
| <i>Salmonella</i> | 375 g | 3.75 L |
| <i>Listeria</i> | 125 g | 1.25 L |
| <i>Cronobacter</i> | 100 g | 1.0 L |

Quantitative methods

Pooling of samples is not applicable to quantitative testing as the bacterial count will be diluted, resulting in the accepting of out of specification product. This would also make it difficult to pinpoint where in the run high counts are coming from as illustrated below.

Specification:

n = 5 (samples needing to be tested) m = 1000 cfu/g (results must be < to be accepted)

| Sample | Individual Sample cfu/g |
|--------|-------------------------|
| 1 | 3000 |
| 2 | 125 |
| 3 | 250 |
| 4 | 100 |
| 5 | 125 |

***Sampling 2 g from each individual sample, we get 7200 cfu per 10 g. We would enumerate a pooled sample, report ≈720 cfu/g, and meet the specification. When enumerating individual test portions the lot of material would be out of specification.**



NQAC

Nestlé Quality Assurance Center
Dublin

COMPOSITING (POOLING) MICRO SAMPLES

References:

- ISO 6887-1:2017

Microbiology of the food chain — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 1: General rules for the preparation of the initial suspension and decimal dilutions

<https://www.iso.org/obp/ui/#iso:std:iso:6887:-1:ed-2:v1:en>

- Int J Food Microbiol. 2017 Mar 20;245:13-21. doi: 10.1016/j.ijfoodmicro.2017.01.005. Epub 2017 Jan 16.

Validation of test portion pooling for *Salmonella spp.* detection in foods.

Tomás Fornés D¹, McMahon W², Moulin J¹, Klijn A³

- **Poster presented at: IAFP 2016, St. Louis, Jul 29 - Aug 3**

Validation of Test Portion Pooling for the Detection of *Listeria spp.* and *L. monocytogenes* in Dairy Products.

Jagadeesan B., Bastic Schmid V., Klijn A., Mc Mahon W.

- **Bacteriological Analytical Manual, Chapter 1, Food Sampling and Preparation of Sample Homogenate, April 2003**

Authors: Walla H Andrews and Thomas S. Hammack

<https://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm063335.htm>

ISO 17025 Accredited

We receive, test and report seven days a week.