

Method ring test

Sample homogenisation

P2601-MRT



Summary

The entire report is available to participants only.

The method ring test is designed, realised, evaluated, and authorised on behalf of PROOF-ACS GmbH by

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in cooperation with
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PROOF-ACS is a DAkkS accredited proficiency testing provider according to DIN EN ISO 17043:2023 (D-EP-22211-01-00). This method ring test is covered by the scope of accreditation.

PROOF-ACS GmbH does not have any analytical laboratory facilities of its own. Homogeneity testing and stability testing are subcontracted to laboratories, accredited according to DIN EN ISO 17025. The subcontracted laboratory may also participate in the ring tests. If so, the laboratory is treated in the same way as other participants, and the same rules of confidentiality apply.

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The proficiency test evaluates the competence of laboratories in homogenisation, both in terms of theoretical knowledge, and in practical application.

The labs are asked to

- homogenise samples of fruits, vegetables and oilseeds, as representatives of the most common commodity groups in the labs.
- identify any abnormalities or peculiarities in the sample and treat them accordingly.
- answer subject-specific questions regarding the respective sample.
- answer general questions on the topic of homogenisation.
- provide a photographic record and a description of their process of sample reception and homogenisation.

Three test materials are sent out:

Leek: 5 leeks, total weight of 1.2 to 1.4 kg

Lime: 18 whole limes, total weight of about 1.4 kg

Linseed: 550 g of linseed, brown linseed, mixed with yellow linseed

Each of the three samples presented at least one challenge or manipulation.

- Leek:
Removal of roots and adhering soil.

Incorrect sample size: the overall weight of the leek sample is too low. The sampling guideline stipulates that, for large fresh produce items (units generally > 250 g), the laboratory sample should consist of at least 10 units with a total weight of at least 2 kg.

- Lime:
Removal of stems and stickers.

The client also requested a toxicological evaluation according to the cover letter. The labs are requested to prepare a homogenate of the edible part of the lime for that purpose.

- Linseed:
According to the cover letter, yellow linseed is provided. A mixture of mainly brown linseed with 10 % of yellow linseed are provided. The labs are requested to identify the mismatch between the announced and the provided test material. Best practice would be to consult the customer on this matter before proceeding.

The evaluation is carried out using a scoring scheme – both for individual assessments and for the entire interlaboratory test. Points are awarded for correct answers in the questionnaire, correct procedures for homogenisation, meaningful pictures of the process, and correct identification of the abnormalities of the respective samples. A minimum of 51 % of the maximum points are required for satisfying participation. The individual subcategories general section, leek, limes, and linseed are evaluated separately, and the overall performance is evaluated as well. Satisfying results are subclassified as “excellent”, “very good”, “good”, and “okay”. Labs, which fail for one of the subcategories can still pass the test with respect to the overall performance

7 laboratories across four European countries (Cyprus, Germany, Greece, and Italy) took part in the proficiency test. All labs kept the term of submission of results and are considered for evaluation.

Results

The results are summarised in the table below.

Category	No of labs with satisfying results - passed				No of labs with dissatisfying results
	excellent	very good	good	okay	failed
General section	0	2	4	1	0
Leek	0	1	2	4	0
Limes	0	1	2	2	2
Linseed	1	0	0	4	2
Overall performance	0	1	4	2	0

To summarise:

- 7 laboratories took part in the tests. All labs reported results and are considered for evaluation.
- Most laboratories have a very sound understanding of the theoretical principles underlying sample homogenisation. However, practical experience has shown that there are sometimes significant discrepancies between theoretical knowledge and its practical application.
- The sample reception, as one of the first and highly important steps in the labs is included in the ring tests. In the supplementary questions, the laboratories are asked to describe the sample in the same way they would in their test report. None of the laboratories achieved full marks in this section. In fact, most of them scored zero points. This is an unexpected result, as providing a correct sample description in a test report is a routine task in the labs.
- For the most part, the challenges or manipulations of the sample material are not recognised or at least not reported. This, in turn, led to significant point losses in the individual matrix categories.
- The equipment used for pre-shredding in all laboratories is generally suitable for this purpose. However, the photographs submitted show that some laboratories could take greater care with their cleaning routines; likewise, the condition of the cutting board surfaces should not be overlooked.
- When preparing the analytical sample from the laboratory sample, most laboratories used the entire sample received. The whole plant parts are segmented, with sections used for homogenisation and the rest of the segments kept as retain sample. This procedure ensures that the analytical sample is highly representative.

- The most challenging matrix in the test is linseed. Some of the laboratories produced only very coarse-grained homogenates, with the result that whole linseed is still visible in some of the samples.
- The use of dry ice results in significantly finer homogenate structures, particularly when the sample contains hard shell fragments (limes) or is high in fat (linseed). It is not possible to assess the extent to which the duration of homogenisation also influenced the fineness of the homogenate, as not all laboratories provided details of the duration of the homogenisation process.
- It can generally be said that the laboratories are performing well and possess the necessary expertise. However, there is still room for improvement when it comes to the practical handling of samples and homogenisation.