



Fera Science Ltd (Fera)

Protocol for Proficiency Testing Schemes

Version 6, January 2023

Part 3 – Fapas[®] Food Microbiology scheme (FEPAS)

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PREFACE

This Protocol is a series of inter-related documents. This document, Part 3, sets out specific details for the Fapas® Food Microbiology Scheme (FEPAS). Although this document duplicates some of the text in Part 1 – Common Principles, it cannot be used in isolation. Part 3 must always be read in conjunction with Part 1 and vice versa.

VERSION HISTORY

This Protocol was completely revised in 2009, superseding all proficiency testing scheme Protocols previously published by Fera in any of its incarnations.

Version 6 of January 2023, this version, supersedes Version 5 of April 2017. The changes are as follows;

- 3.4 availability of surplus test materials
- 4 clarification of log transformation in z-score formula
- 4 Description of standard deviation values for MPN and *Campylobacter* spp.
- 5 References updated
- Contact information updated

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1. INTRODUCTION

1.1. Fera, PTG, Fapas® and FEPAS

Fera was vested on 1 April 2015. Fera provides a wide range of proficiency testing (PT) schemes under the brand name of Fapas®. The management of these PT schemes is the sole task of one team within Fera, known internally as the Proficiency Testing Group (PTG).

For the purpose of this Protocol we use Fapas® to mean Fera PTG. Part 3 of this Protocol, i.e. this document, specifies details relating only to the Fapas® Food Microbiology scheme (FEPAS).

1.2. Accreditation

Fera Science Ltd is a UKAS accredited Proficiency Testing Provider, No. 0009. Accreditation is conferred upon Fapas® Food Microbiology scheme (FEPAS) in accordance with ISO/IEC 17043:2010 [1].

The formal schedule of the accreditation can be obtained from the United Kingdom Accreditation Service (UKAS) web site (Adobe PDF format) [2].

Unless otherwise specified in the detailed programme or brochure, all Fapas® Food Microbiology scheme (FEPAS) PTs can be considered to be within scope of accreditation. Details of the PTs and scope can be inferred from the published brochure and schedule of accreditation.

2. ORGANISATION OF FOOD MICROBIOLOGY SCHEME (FEPAS)

2.1. Management System

The accredited management system covers all aspects of the PTs organised by Fapas® Food Microbiology scheme (FEPAS), i.e. the same system applies whether a particular PT is within scope of accreditation or not.

The management system includes:

- Detection tests (qualitative)
- Enumeration tests (quantitative)
- Single target organisms and combinations of target organisms
- Unknown organism identification
- Inclusion of background flora in most test materials, to simulate real samples

3. PARTICIPATION IN SCHEMES

3.1. Test Material Preparation, Homogeneity and Stability

All Fapas® Food Microbiology scheme (FEPAS) test material preparation and homogeneity testing is carried out by subcontracting laboratories. Details of test material preparation and homogeneity results are retained by Fapas® but no longer published in the reports. Verification of test materials for the qualitative PTs is carried out by subcontracting laboratories. Verification results for the qualitative PTs are published in the reports.

Participants may contact Fapas® to request details of test material preparation and homogeneity testing, where it is pertinent to their assessment. Such details may be released on request, except where this compromises data which is commercial in confidence or where such knowledge is scientifically invalid in the interpretation of assessments.

Stability of food microbiology samples is tested under ideal and simulated transportation conditions over the duration of the PT (typically a four-week period). Stability testing is a subcontracted activity.

3.2. Dispatch and Receipt of Test Materials

Fapas® Food Microbiology scheme (FEPAS) test materials are sent to all participants by courier, and so can be tracked on-line throughout their journey. It is the responsibility of the customer to anticipate an email on the day of dispatch advising them of the tracking number and then to monitor the progress of their samples. It is particularly important for non-UK participants to track their samples to ensure a smooth transit through their country's Customs. Fapas® cannot be held responsible for delays arising at Customs.

3.3. Analysis of Test Materials

It is the responsibility of participants to read the instructions (provided electronically via email or downloaded from the Fapas® website, www.fapas.com) and follow them exactly prior to conducting the actual analysis of the test material. Fapas® cannot be held responsible for any problems arising from failure to comply with these instructions.

Some of the Fapas® Food Microbiology scheme (FEPAS) test materials require preparation (usually re-hydration) by participants before analysis. Instructions for this procedure can be downloaded from the Fapas® website. Fapas® Food Microbiology scheme (FEPAS) PTs additionally have a timeframe (stipulated in the instructions) within which the analysis should be completed, due to organism/matrix stability.

Example instructions are available on request from Fapas®.

3.4. Follow-Up Services

Fapas® historically has not sold surplus test materials from the batches used for Fapas® Food Microbiology scheme (FEPAS) PTs (due to their limited shelf life). Following more extensive stability testing, some surplus test materials may be made available for purchase immediately following the publication of the PT report and for a limited period of time only. Participants in the PT will be notified of the availability of such materials.

Most Fapas® Food Microbiology scheme (FEPAS) reports issued since 2000 are available for purchase. Prices are available on request. Participants in all the Fapas® schemes have free access to an electronic copy of reports for those tests for which they have registered. Electronic copies of reports are available on request and a charge will be made for these.

If a participant wishes to obtain advice on any aspect of their performance they should contact Fapas® by email (info@fapas.com) in the first instance. Participants must note that Fapas® may offer assistance in the form of a broker service whereby Fapas® will either anonymously or, subsequent to all parties agreeing to waive their confidentiality, pass on the participant's inquiry to an expert laboratory/external advisor.

4. PERFORMANCE ASSESSMENT

Fapas® Food Microbiology scheme (FEPAS) PTs for detections (qualitative assessments) express participants' results as either satisfactory (S) or not satisfactory (NS), as compared to the intended result (for a spiked and verified test material). The assessment is based on the correct detection in all of the test materials provided.

Enumeration Microbiology PTs (quantitative assessments) express participants' results as z-scores. The assigned value is the consensus of participants' valid results. Results reported by participants are first log transformed (to units of $\log_{10}\text{cfu/g}$), prior to the statistical assessment, to obtain the normal distribution. Hence, the formula for calculation of z-scores is modified to;

$$z = \frac{(x - x_a)}{\sigma_p}$$

where x is the participant's reported result, after $\log_{10}$ transformation

x_a is the assigned value, on $\log_{10}$ transformed values

and σ_p is the standard deviation for the proficiency test, in the $\log_{10}$ domain.

The standard deviation for proficiency assessment is derived from retrospective Fapas® Food Microbiology scheme (FEPAS) data and a value of 0.25 $\log_{10}$ cfu/g is generally applied. The principal exceptions are for MPN enumeration proficiency tests where σ_p has been inflated by a factor of 1.17;

$$\sigma_p = 0.25 \times 1.17 = 0.2925 \log_{10}\text{MPN/g}$$

and the enumeration proficiency tests for *Campylobacter* spp. which adopts σ_p equal to 0.35 $\log_{10}$ cfu/g to be more fit-for-purpose for this test. The factor of 1.17 for MPN tests was derived from a study (unpublished) of Fapas® MPN proficiency test data. This approach is supported by the Fapas® Advisory Committee and is recommended in ISO 22117 [3]. For new enumeration PTs, consideration is given to the novelty of the PT in initially setting the standard deviation (for example, 0.35 $\log_{10}$ cfu/g in the first instance) until the PT has become established and the standard deviation can be revised.

Fapas® Food Microbiology scheme (FEPAS) also provides a PT for the detection and identification of unknown pathogens to genus and species level. The assessment is based on the correct detection in all of the test materials provided.

5. REFERENCES

- 1 ISO/IEC 17043:2010, Conformity assessment – General requirements for proficiency testing.
- 2 <http://www.ukas.com>, accessed 09/12/2022
- 3 ISO 22117:2019, Microbiology of the food chain – Specific requirements and guidance for proficiency testing by interlaboratory comparison

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