

Proficiency Testing Schemes: solutions for food safety

Food safety, nutrition and food security are strongly linked and are a worldwide major concern. According to the World Health Organization, almost 600 million people fall ill after eating contaminated food and 420,000 people die every year.

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Access to safe food products is essential to sustaining human life and preserving consumer health. Most of the foodborne illnesses derive from meat, sea products, dairy products, etc, contaminated by pathogenic micro-organisms.

The need of laboratories for efficient quality control of analysis leads them to participate in Proficiency Testing Schemes (PTS) which helps them prevent analytical deviations in performance monitoring.

This solution offers tremendous potential to improve the safety and the quality of foodstuffs. Indeed, proficiency testing is designed as a complete solution to laboratories testing' performance.

Internal and external quality controls implemented in the laboratories are essential to ensure the validity of the results, PTS perfectly meet this objective. The evaluation of analytical performance is essential to ensure the accuracy of laboratory analytical results and consequently, food safety.

Attendance in proficiency testing programme is one of the standard of ISO/IEC 17025 requirements in order to provide analytical results with reliability.

Quality in food remains a huge public health and economic concern worldwide.

That is why continually evaluating laboratory performance through participation in proficiency testing remains an effective means of control for improving reliability of results in order to enhance health quality in food.

Definition of a PTS

According to ISO/IEC 17043, a PTS is defined as the evaluation of a laboratory's testing by means of performance, using interlaboratory comparisons. These are used to monitor the continuity of laboratory performance.

Objectives of a PTS

The main purpose of interlaboratory comparisons used in PTS is to monitor the continuity of laboratory performance.

In addition, participation in a PTS also enables the laboratory to:

- Detect analytical problems.
- Demonstrate the accuracy of their results to third parties.
- Compare the methods used by the laboratories.
- To validate the uncertainties in measurement claimed by the laboratories.

How to participate in a PTS?

Participation in a PTS follows a classic and simple pattern: after registering the laboratory to the PTS of interest, the laboratory receives the samples according to the defined schedule and carries out the analysis. After the results' transmission, a statistical treatment is carried out before the report is sent.

The report is provided to the laboratory with several information. Firstly, an overall summary of the results, which includes the data of the PTS programme: from the design of the programme to the participants' results, including statistical treatment, homogeneity, stability checks. Secondly, an individual summary of its results with a judgement of its performance by criteria.

Available programmes in food

In this field, Proficiency Testing providers offer a wide range of proficiency testing in chemistry,



microbiology, and sensory and with real matrices' samples.

Real matrices available

BIPEA offers several proficiency tests depending on different types of analysis, and based on a wide range of real matrices: raw materials, vegetables, fruits, oil, meat, fish products, dairy food, oil, honey etc.

The analysis of these samples must be carried out under routine conditions in terms of the procedures and applied methods.

● Chemistry analysis:

The food programmes are offered as a whole and account for a variety of analytical parameters such as nutrient values, amino acids, minerals and vitamins with a variety of matrices.

● Microbiological analysis:

Several programmes dedicated to the detection of *Salmonella* spp, *Listeria monocytogenes* and enumeration of several micro-organisms in real matrices (minced meat, fruits juice, wine, milk).

● Contaminants and mycotoxins:

Programmes for the analysis of mycotoxins, trace elements, pesticides, and other contaminants on raw materials and processed products are offered.

BIPEA launched two new programmes in 2023:

• PTS 20G: Fish and fishery products:

This trial offers a frozen fish for the analysis of the following parameters: caloric value, total carbohydrates, minerals, vitamins, fatty acid profile.

• PTS 101D: Microbiological testing of surfaces – sampling and detection of listeria:

This trial consists of analysing contaminated stainless steel plate samples for the detection of *Listeria monocytogenes* and *Listeria* spp.

Conclusion

The consequences of deviation in the analytical results of a laboratory are numerous and can lead to the emergence of crises within the agri-food industries that can impact consumer health and jeopardise the industries' economy.

PTS are crucial for detecting regressions in laboratories performances, hence helps with favouring a corrective measure over another. Increase in demand from laboratories to take part in PTS proves the interest for laboratories in their quality control approach according to the ISO/IEC 17025 standard requirements.

Sustainability for participation in these PTS is a key to helping laboratories to have confidence in their results. Ensuring food safety is a daily challenge for testing laboratories that are continually seeking to improve efficiency, productivity and profitability. ■