

GSC

Consultoría de calidad cercana

What role does the nature and presentation of the sample play in all the stages of an exercise?

Ana Peris García-Patrón , Lola Sualdea Moraleda

Gabinete de Servicios para la Calidad (GSC), Madrid, Spain (gscsal@gscsal.com)

ABSTRACT

When a laboratory participates in a proficiency testing program, it expects the interlab testing to resemble the ordinary samples it analyses. This allows the laboratory to draw useful conclusions about its performance. However, sometimes the preparation and presentation of the sample do not always respond to reality, due to multiple restraints. There are pros and cons from the supplier's and/or customer's point of view related to the samples presentation. We expose here results of our experience, feedback from customers and from the team of auditors and consultants who have taken part of this study.

MAIN SAMPLES TIPOLOGYS

Nature



A

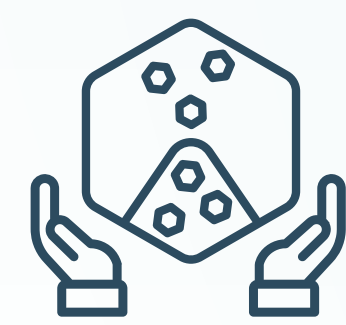
Natural/
naturally contaminated



B

Spiked samples

Preservation and presentation



C

Homogenized and
preserving their nature.



D

Homogenized and preserved by
lyophilization, freezing, etc.
Analytes could both be already
spiked or not.

ADVANTAGES/DISAVANTAGES

Sample type	Similar to ordinary sample (1)	Pre-analys handling (2)	Results collusion/ falsification (3)	Manipulation Mistakes (4)	Sample behaviour (natural vs spiked) (5)	False assigned value (6)	Special Preservation needs (7)	Special delivery needs (8)
A+C	Very Good ✓	Low ✓	Very unlikely ✓	Low ✓	Good performance ✓	Very unlikely ✓	As ordinary samples ✓	As ordinary samples ✓
A+D	Not Very Good (Liofilized or/and concentrate presentation) ✗	High ✗	Not very unlikely ✗	High ✗	Good performance ✓	Very unlikely ✓	Special needs ✗	Special needs ✗
	Very Good (frozen presentation) ✓	Low (frozen) ✓	Very unlikely (frozen presentation) ✓				Not special needs in liofilized ✓	
B+C	Very Good ✓	Low ✓	Very unlikely ✓	Low ✓	Not good performance ✗	Likely ✗	As ordinary samples ✓	As ordinary samples ✓
B+D	Not Very Good (Liofilized or/and concentrate presentation) ✗	High ✗	Not very unlikely ✗	High ✗	Not good performance ✗	Likely ✗	Special needs ✗	Special needs ✗
	Very Good (frozen presentation) ✓	Low (frozen) ✓	Very unlikely ✓				Not special needs in liofilized ✓	

1. Customers consideration about samples being as ordinary samples
2. Customers perceive inconveniences when sample handling other than normal is required. Risk of contamination/lost is present
3. When samples are presented in the form of a concentrate or a lyophilisate that must be reconstituted, it can lead to inadequate preparation, without following instructions, which can lead to "dishonest" results.
4. Manipulation may cause contamination issues or analytes lost and risk of mistakes in following instructions
- 5, 6. When samples are presented in the form of a concentrate or lyophilisate that must be reconstituted, differences between the recovery in the natural and spiked parameter may occur. Risk of incorrect evaluation, since the assigned value may be affected.
7. Frozen samples and samples presented as a concentrate that has to be added, may need special preservation conditions before analysis. Preserved samples may increase pre-analytical periods
8. Controlled transport (time/temperature) is necessary depending on the nature of the sample. Suppliers in any case need proof of good delivery conditions.

CONCLUSIONS

- ▶ Naturally contaminated samples ensure laboratories reliable results for consensus values, as the studied parameters are of natural origin and behave more closely to what is expected by analytical methods. On the downside, in natural samples, the desired levels (e.g., legal thresholds) may not always be achieved
- ▶ Spiked samples allow for the easy attainment of desired levels, but they can lead to incorrect consensus values due to the differing behavior of the spiked analytes compared to those naturally present in the samples. In cases where the analytes are not spiked by the provider but require participant addition, there is a risk that the analysis may not be performed as intended.
- ▶ The use of preservation techniques allows proficiency testing providers to achieve greater stability in samples for shipments to distant locations, with longer storage times. However, their use can lead to contamination issues or improper handling by participants, and if participants are required to add analytes, it may result dishonest results.