COEPT THE INTER-COMPARISON OF INTER-COMPARISONS

Summary of the talk presented by Dr Piotr ROBOUCH (Institute for Reference Materials and Measurements, IRMM, Geel, Belgique) at CECALAIT's AGM 2005

The participation of laboratories in proficiency tests is obligatory because of the requirements of accreditors, legislative authorities, customers. They often participate in several proficiency tests which involve extra-cost s(time and participation fees), and restrictions concerning free trade.
COEPT (the Comparability of the Operating and Evaluation Proficiency Testing schemes) is an European program of evaluation and comparison of protocols used by providers of proficiency tests. 17 partners participated in this European project in 2003-2005. It regrouped about 30 proficiency test providers in 4 sectors (water, soil, food, and hygiene & safety). 3 working seminars have been held in Berlin (February 2003), Geel (October 2003) and Eden (February 2005), and 2 inter-comparisons have been realised.

1st inter-comparison

The objectives were:

- to evaluate the similarities, or differences, of statistical protocols applied by the proficiency test providers and the influence on the reference value, the uncertainty, the deviation…
- to evaluate the capacity of the protocols to meet difficulties concerning a set of data (bimodality or dissymmetry for example)
- to compare the evaluation of performance

Concerning the food sector, 5 proficiency test providers participated in this inter-comparison. 11 data sets on fat, protein, moisture, lactose and ash were transmitted to providers for statistical treatment. The evaluations realised were returned to COEPT for comparison (mean, standard deviation of the reference value, evaluation).
Taking into mind the results transmitted, it appeared that there was a good concordance between the 5 proficiency test providers of this sector. However, the estimation of the uncertainty associated to the assigned value is a point which requires close attention. Indeed, even though 3/5 providers supply this parameter, the range observed between the estimations is high.

2nd inter-comparison

It was carried out between February and November 2004. The objectives were:

- to study the performance of the statistical protocols of the proficiency test providers in a real case,
- to see if the results of the 1st inter-comparison were confirmed when a reference material in a proficiency test is used,
- to study the evaluation made by the proficiency test providers.

5 proficiency test providers participated in this inter-comparison (Relacre, Muva, Cecalait, Fapas, QM). A sample of reference material (dry milk produced by a provider of the study) was sent to the laboratories participating in the inter-comparison (172 laboratories). The inter-comparison has been organised on 5 criteria : fat, dry matter, lactose, protein, and ash.

After analysis and comparison of the results by COEPT, it appeared that globally, there was a good agreement between the assigned values determined by the providers, as well as the reference values of the reference material supplied.

	Certified Uncertainty Value	Reported Reference standard Deviation Value							
		F01	F02	F03	F04	F05	Mean	s	RSD
Ash	5.64 0.04	5.67 0.05	5.66 0.07	5.64 0.04		5.64 0.05	5.65	0.01	0.3%
Dry matter	96.11 0.11	96.3 0.2	96.2 0.2	96.1 0.2	96.2	96.1 0.1	96.2	0.1	0.1%
Fat	26.03 0.11	26.0 0.1	25.8 0.5	26.0 0.2	26.0	26.0 0.1	26.0	0.1	0%
Lactose	37.64 0.45	23.8 0.6	35.4 1.1	37.6 0.5	36.7	37.6 0.8	34.8	5.5	15.7%
Protein	26.65 0.09	26.09 0.30	26.60 0.85	26.65 0.17	26.87	26.65 0.28	26.58	0.26	1.0%

However, during the examination of the raw results, deviations, due to the definition and comprehension of the criteria, were observed:

- moisture and dry matter
- nitrogen and protein
- lactose monohydrate and anhydrous

The expression of the results in the correct units permitted to obtain a total concordance on all the criteria between the assigned values determined. Only in the case of the determination of lactose, the assigned value of a provider has been identified as non-concordant with the other assigned values and the reference value of the reference material supplied.

After study, it appeared that this difference was due to the results of only one laboratory.

Conclusion

To conclude, it appears that there is a good concordance between the participants concerning the assigned values on artificial data sets or during a real inter-comparison. Nevertheless, it appears that it was necessary to improve and harmonise the definition and the comprehension of criteria in order to have results expressed in the same units. Finally, the set up of the uncertainty estimation on the assigned values seems indispensable.