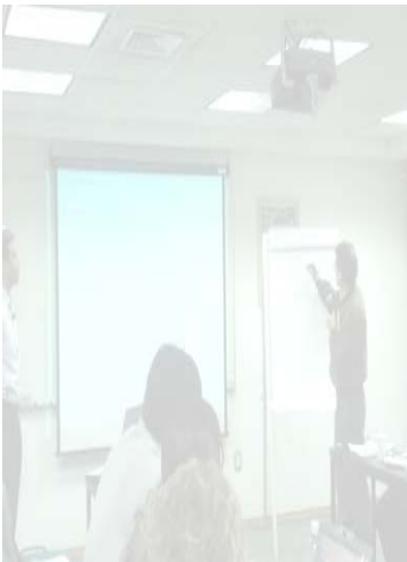




**IAAC – PTB**

# **Proficiency Testing Training Course**



## **Part IV: Improvement**

**Moderation: Imilce Zuta**  
[imilcezuta@gmail.com](mailto:imilcezuta@gmail.com)  
**PTB**

**Co-Moderation: Hugo Guerrero**  
**PTB**



**November, 19th to 21th 2008**

## CONTENT

1.	PRESENTATION	4
2.	OBJECTIVE	4
3.	DEVELOPMENT	4
3.1	METHODOLOGY	4
3.2	PROGRAMME AND CONTENT	5
3.3	MATERIAL	8
3.4	SUMMARY OF PRESENTATIONS	8
4.	PARTICIPANTS	9
5.	EVALUATION OF WORKSHOP BY THE PARTICIPANTS	12
6.	EVALUATION OF PROFICIENCY TESTING REPORTS	15
7.	RESULTS	16
8.	TASKS PROPOSED	17
9.	NEEDS PROPOSED	17

## 1. PRESENTATION

The fourth workshop for Proficiency Testing “Improvement” has been developed as a conclusion of a series of three workshops that has been performed before, in the framework of PTB-IAAC projects, each one of them with a specific objective that identify an action of Deming Cycle.

- I Workshop: “Identification of Demand and Proficiency Testing Providers”, INDECOPI had in charge the organization of this event.
- II Workshop: “Preparation of a Proficiency Testing” in this case, Honduras was the host country, the OHA-COCHIT organized it.
- III Workshop: “Evaluation of the Proficiency Testing Reports Done”, it was held in Costa Rica, being organized by ECA.

At the end of each workshop, some tasks were assigned for strengthening the capabilities of participants – representatives mainly from Accreditation Bodies and Proficiency Testing Providers of IAAC members – in organizing and analyzing the Proficiency Testing results, in the framework of the international guides set up by IAAC and other applicable normative documents.

## 2. OBJECTIVE

The development of this workshop was aimed to:

- Strengthen the capabilities of the participants in the organization and development of proficiency testing.
- Identification of improvements referred to the management of proficiency testing and its use, through the activities developed by the participants during the workshop.
- Highlight the importance and strengthen the interaction among the Accreditation Bodies and their stakeholders related with proficiency testing.

## 3. DEVELOPMENT

The workshop was carried out since 19th to 21st November 2008 in Mexico City (D.F.) in “Sala de Excelencia” room in Mexican Accreditation Body (ema), whose personnel give us support in the organization of the event.

### 3.1 METHODOLOGY

The workshop was developed with presentations in power point, exercises by each session, searching for consolidating the understanding in these subjects, like the establishment of patterns and design of guidelines, application of statistics for developing proficiency testing and revision of corresponding reports.

The groups for each proficiency testing make the respective presentation:

- Green Group: Water for Human Consumption
- Yellow Group: Flour
- Red Group: Blood

The presentations were in charge of Regional Coordinators of each proficiency testing. About these issues, arose a good interchange of information supported by the experts in the workshop.

Finally, by means of different tools, we tried to integrate the knowledge granted, propounding activities for being performed by the participants, and also a proposal of actions to be adopted in future with the objective for giving continuity and sustainability to proficiency testing component.

The workshop was held in Spanish, with simultaneous translation to English, however, occasionally the speaker talked each other with Caribbean participants in English.

### **3.2. PROGRAMME AND CONTENT**

The event was executed according to planned with the contents of the programme, which were in brief the following:

- First day: Accreditation Bodies: Guidelines on the accreditation system for providers of proficiency testing.
- Second day: Laboratories: Guidelines on the use of the results of proficiency testing
- Third day: Evaluation of final reports of proficiency testing organized as part of this cycle of workshops

Each day, it has developed study cases of implementation. The groups were organized in three groups: yellow, red and green (see figures 1, 2 and 3):

- Case 1: Designing a system of accreditation of testing
- Case 2: Performance Evaluation and statistical calculation.
- Case 3: Analysis of the final reports of proficiency testing organized within the programme.



Figure 1: Yellow Group



Figure 2: Green Group



Figure 3: Red Group

In the chart 1, we show the programme of the event in detail.

**Table 1: General Programme**

Day/Description
<b>First Day</b>
<p>Opening, Introduction  Presentation of Participants  <b>The role of the PT results in the accreditation procedure: Overview, monitoring and surveillance</b>  Presentation of Management PT by Yoshito Mitani, CENAM  Presentation of Management PT by Carlos Gómez, Fundación Chile  Presentation of ISO DIS 17043 by Imilce Zuta, PTB  Workshop  <b>Criteria for the evaluation of PT reports during a laboratory assessment</b>  Presentation of some criteria by Aida López, ema  Workshop: Designing a system of accreditation of proficiency testing providers</p>
<b>Second Day</b>
<p><b>Interpretation of the results of a PT. Z-score, ECMR, Youden-Plot.</b>  CENAM, Yoshito Mitani  Fundación Chile, Carlos Gómez  Discussion and Workshop  <b>The benefits of PTs for the laboratory:</b>  <b>Benchmark, reference values, quality assurance. How to assess PT reports and analyze PT trends?</b>  PT results into quality assurance measures and for estimation of measurement uncertainty, by Hugo Guerrero, PTB  Workshop: Assessment and calculation of statistical performance</p>
<b>Third Day</b>
<p>Homogeneity and Stability by Imilce Zuta  <b>PT developed. How to assess PT reports and analyze PT trends?</b>  Presentation of Water PT Report, by Hugo Guerrero, PTB  Presentation of Food PT Report, by Julia de Saldivar, CONACYT  Presentation of Clinical PT Report, by Claudette Brown, JANAAC and Imilce Zuta, PTB  Presentation of CENAM Report, by Yoshito Mitani, CENAM  Workshop: Analysis of the final reports of the proficiency testing organized within the program.  <b>How to direct to assure an adequate reference value? by Imilce Zuta, PTB</b>  <b>Statistical design of a PT. Determination of Useful Criteria for PT Providers, for Laboratories in the use of PTs, about the interpretation of PT reports . Summary. By Imilce Zuta, PTB</b></p>

### 3.3. MATERIAL

The contents of the workshop, presentations and results of the activities and additional material were in a CD.

### 3.4. SUMMARY OF PRESENTATIONS

There were four experts for the presentations, comments and giving orientation to the participants about the subjects developed.

In a general framework, both “Fundación Chile” and CENAM – through their representatives, Mr. Carlos Gómez and Mr. Yoshito Mitani, respectively, showed synergic activities with some entities related with. Fundación Chile showed a coordinated work with the Chilean governmental entities, they are now developing some actions with governmental support in manufacturing reference material of the main products of the country, like salmon (fish) and wine.



CENAM, showed a close relationship with the Mexican Accreditation Body (ema). CENAM elaborates reference materials according to the demands of ema.

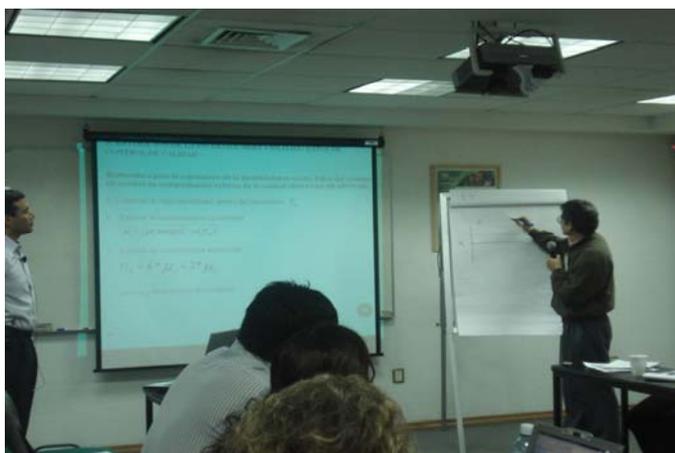
Afterwards, Ms. Imilce Zuta from PTB, showed the main modifications of ISO DIS 17043 respect to its last version, which are the following: sub-contraction, traceability, assigned value, and report, requirements to take into account later.

It raised the main criteria to consider in the accreditation of proficiency testing providers according to the current framework. For this issue, we had the support of Aida López from ema.

To reinforce the statistical component, Mr. Carlos Gómez and Mr. Yoshito Mitani addressed the application of z-score, ECMR and Youden-Plot, as tool of performance evaluation of laboratories, when they participate in a Proficiency Testing. A special activity was developed about it.

Moreover, there were presentations about definitions of technical concepts and some statistical estimation contained in a proficiency testing as the homogeneity and stability according to the IUPAC, which was in charge of Ms. Imilce Zuta and Mr. Carlos Gómez. Also, it was addressed the assigned value issue.

As a way to show the usefulness of a proficiency testing, Mr. Hugo Guerrero from PTB propounded how to estimate the measurement uncertainty for a testing method since a proficiency testing, considering the assigned value.



The presentations of proficiency testing reports concluded, were in charge of the Regional Coordinators. Participants exposed comments and observations to them.

- Water Proficiency Testing, was exposed by Hugo Guerrero
- Flour Composition Proficiency Testing, was exposed by Julia de Saldívar (ONA-CONACYT)
- Glucose, Cholesterol and Triglycerides Proficiency Testing was exposed by Imilce Zuta and Claudette Brown.

There was a good interchange of information among the participants, supported by the speakers.

The developed activities in the workshops, especially in this fourth one, have granted us elements for a better understanding in proficiency testing and in consequence the usefulness of this tool in order to the laboratory could take advantage of it.



Based on these expositions, it was proposed some criteria to use for Proficiency Testing Providers.

Respect to evaluation of proficiency testing reports, it was concluded that it is convenient the Accreditation Body analyzes, being equate as possible, its actions respect to the results of reports, considering the probable reasons because of a z-score is non – satisfactory or questionable, and not only taking a decision based on the z-score value got by the laboratory.

Also the moderator presents some criteria to consider in the evaluation of proficiency testing during the assessment of a laboratory.

The experts were available to collaborate in the development of practical cases, to participate in the discussions and in the analysis of contents of proficiency testing reports made by the participants.

#### 4. PARTICIPANTS

In the following table, we can see the participants of the IV Workshop who have participated in the majority of the rest of workshops.

**Table 2: List of participants**

N°	Name	Organism	Charge	Country
1	Laura Pastore	Organismo Argentino de Acreditación	Profesional Técnico Área Laboratorios	Argentina
2	Giselle Guevara	Caribbean Laboratory Accreditation Service - CROSQ	Project Coordinator	Barbados
3	Diego Moya Alarcón	Dirección Técnica de Acreditación – DTA del IBMETRO	Responsable de Acreditación de Laboratorios	Bolivia
4	Olga Benário Ramos Leal	Cgcre/Inmetro –Coordenação Geral de Acreditação do Instituto Nacional de Metrologia e Qualidade Industrial	Tecnologista/Pesquisador	Brasil
5	Maria Patricia Gutierrez Bonilla	INN	Subjefe de División Acreditación	Chile
6	Patricia Murillo	Ente Costarricense de Acreditación	Evaluadora ECA	Costa Rica
7	María Miranda Vaquero	ONARC	Jefe de la Secretaría Ejecutiva	Cuba
8	Carlos Samaniego Viteri	Organismo de Acreditación Ecuatoriano	Director del Área de Acreditación de Laboratorios	Ecuador
9	Jaime Alberto Hernández	CONACYT	Analista Químico	El Salvador
10	Carolina Richter de Penados	Oficina Guatemalteca de Acreditación	Evaluadora Técnica	Guatemala
11	Claudette Brown	Jamaica National Agency for Accreditation – JANAAC	Technical Manager	Jamaica
12	Anthony Greenaway	Jamaica National Agency for Accreditation – JANAAC		Jamaica
12	Julia Maldonado de Saldivar	Organismo Nacional de Acreditación-ONA	Coordinadora de Ensayos de Aptitud	Paraguay
13	Violet Davis Maurice	Trinidad and Tobago Laboratory Accreditation Service - TTBS	Manager (Acting)	Trinidad & Tobago

Además, participaron como expertos:

**Table 3: Experts**

N°	Name	Organism	Country
1	Yoshito Mitani	CENAM	México
2	Imilce Zuta	PTB	Perú
3	Carlos Gómez	FUNDACIÓN CHILE	Chile
4	Hugo Guerrero Postigo	PTB	Bolivia



From left to right: Standing: Jaime Hernández (CONACYT), Carlos Gómez (Fund. Chile), Diego Moya (DTA-IBMETRO), Patricia Gutiérrez (INN), Anthony Greenaway (JANAAC), Olga Leal (Cgcre-INMETRO), Giselle Guevara (CROSQ), Violet Davis (TTBs), Yoshito Mitani (CENAM), Maribel López (ema), Imilce Zuta (PTB), María Vaquero (ONARC), Aida López (ema), Carlos Samaniego (OAE), Hugo Guerrero (PTB). Sat: Julia de Saldivar (ONA-CONACYT), Carolina Richter (OGA), Patricia Murillo (ECA), Claudette Brown (JANAAC) and Laura Pastore (OAA).

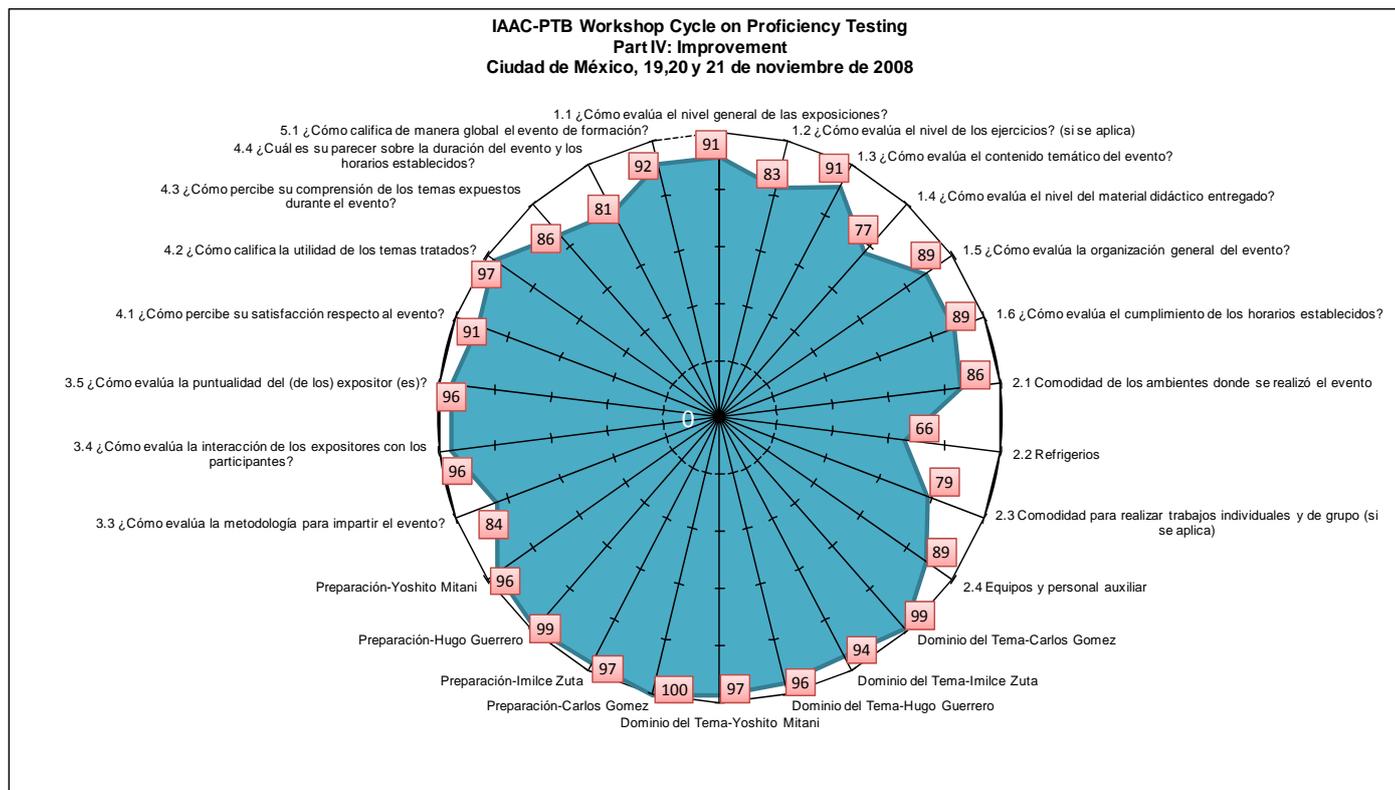
## 5. EVALUATION OF WORKSHOP BY THE PARTICIPANTS

At the end of the workshop the participants made an evaluation. In Table 4 and Graph 1 it is showed the results.

Table 4: Workshop evaluation by the participants

ASPECTO A EVALUAR		1	2	3	4	5	Promedio	%
								
1. EVENTO	1.1 ¿Cómo evalúa el nivel general de las exposiciones?				6	8	4,57	91
	1.2 ¿Cómo evalúa el nivel de los ejercicios? (si se aplica)			2	7	4	4,15	83
	1.3 ¿Cómo evalúa el contenido temático del evento?				6	8	4,57	91
	1.4 ¿Cómo evalúa el nivel del material didáctico entregado?		1	2	9	2	3,86	77
	1.5 ¿Cómo evalúa la organización general del evento?			1	6	7	4,43	89
	1.6 ¿Cómo evalúa el cumplimiento de los horarios establecidos?			1	6	7	4,43	89
2. INSTALACIONES Y SERVICIOS	2.1 Comodidad de los ambientes donde se realizó el evento			1	8	5	4,29	86
	2.2 Refrigerios		3	4	7		3,29	66
	2.3 Comodidad para realizar trabajos individuales y de grupo (si se aplica)			4	7	3	3,93	79
	2.4 Equipos y personal auxiliar				5	8	4,43	89
3. EXPOSITORES	Dominio del Tema-Carlos Gómez				1	3	4,93	99
	Dominio del Tema-Imilce Zuta				4	10	4,71	94
	Dominio del Tema-Hugo Guerrero				3	11	4,79	96
	Dominio del Tema-Yoshito Mitani				2	12	4,86	97
	Preparación-Carlos Gómez					14	5,00	100
	Preparación-Imilce Zuta				2	12	4,86	97
	Preparación-Hugo Guerrero				1	11	4,93	99
	Preparación-Yoshito Mitani				3	13	4,79	96
	3.3 ¿Cómo evalúa la metodología para impartir el evento?				11	3	4,21	84
	3.4 ¿Cómo evalúa la interacción de los expositores con los participantes?				3	11	4,79	96
	3.5 ¿Cómo evalúa la puntualidad del (de los) expositor (es)?				3	11	4,79	96
4. BENEFICIOS PARA EL ASISTENTE	4.1 ¿Cómo percibe su satisfacción respecto al evento?				6	8	4,57	91
	4.2 ¿Cómo califica la utilidad de los temas tratados?				2	12	4,86	97
	4.3 ¿Cómo percibe su comprensión de los temas expuestos durante el evento?			2	6	6	4,29	86
	4.4 ¿Cuál es su parecer sobre la duración del evento y los horarios establecidos?			1	11	2	4,07	81
5. CALIF. GLOBAL	5.1 ¿Cómo califica de manera global el evento de formación?				5	7	4,58	92

Graph 1: Qualification of course by aspect tested.



Then, we present comments and observations about the event made by the participants.

Comments and Observations
1. Presentaciones muy buenas
2. Felicitaciones
3. Complejidad y mayor número de ejercicios
4. Más ejercicios prácticos
5. Mayores actividades de orden técnico
6. Definir el perfil de los asistentes al curso para elevar el nivel
7. Hubiera sido muy útil tener más ejercicios prácticos, creo que los dados fueron muy productivos para la comprensión de los temas
8. Seguir capacitando a los Organismos de Acreditación y evaluadores en este tema.
9. Seguir con las rondas de intercomparación.
10. Ampliar y fomentar la comunicación de las diferentes entidades involucradas, de una u otra forma en la implementación y desarrollo de PTs
11. Queda pendiente el tema de ensayos cualitativos y semi-cuantitativos, también microbiológicos.
12. Entregar al documentación antes del evento
13. Indicar que material se va a entregar para mejorar la toma de notas
14. Traer desarrollado temas por los participantes para mayor avance
15. No estuvo disponible el acceso a internet en la sala lo cual fue desfavorable.

## 6. EVALUATION OF PROFICIENCY TESTING REPORTS

The analysis of proficiency testing reports (Water for human consumption, Flour and Blood); organized as part of this programme, let the interchange of information among the participants, arising comments, recommendations and observations that are showed in the following table:

**Table 5:** Comments, recommendations and observations about the proficiency testing reports.

GRUPO /GROUP	COMMENTS, RECOMMENDATIONS AND OBSERVATIONS
<b>VERDE / GREEN</b>	<ol style="list-style-type: none"> <li>1. General <ul style="list-style-type: none"> <li>• Define the objective of the Proficiency Testing Programme to develop</li> </ul> </li> <li>2. Water Proficiency Testing <ul style="list-style-type: none"> <li>• Declaration of the testing method set up, made over a sample and the reference standard.</li> <li>• Classification of results achieved by analytical technique</li> <li>• Executive summary with interpretation of results.</li> <li>• Relation of conclusions according to the objective defined.</li> </ul> </li> <li>3. Flour Proficiency Testing <ul style="list-style-type: none"> <li>• Detail information about traceability of the sample, homogeneity and stability studies for this sample.</li> <li>• Include Youden Plot and ECM graphics.</li> <li>• Significant figures for the results</li> </ul> </li> <li>4. Blood Proficiency Testing (Serum) <ul style="list-style-type: none"> <li>• Relate the achieved results with the objective of the proficiency testing.</li> </ul> </li> </ol>
<b>AMARILLO / YELLOW</b>	<ol style="list-style-type: none"> <li>1. General <ul style="list-style-type: none"> <li>• Summary or a comparative chart in which we can see the results of laboratory performance related with each analytical technique. This will give the laboratory a specific report which could show to the Accreditation Body, in detail, the performance of the laboratory, giving them more information for its improvement.</li> </ul> </li> <li>2. Water Proficiency Testing <ul style="list-style-type: none"> <li>• Improve the way of presentations of graphics. This is because the majority of the participant laboratories can not evaluate its dates graphically because of its codes are not registered in the graphs.</li> <li>• Include some information referred to the equipment and the testing method used by the participant laboratories.</li> </ul> </li> <li>3. Flour Proficiency Testing <ul style="list-style-type: none"> <li>• Report the assigned value and its uncertainty.</li> <li>• More detailed information about the statistics used in the evaluation of results by the participant laboratories.</li> <li>• Include comments, in Conclusion Chapter, which give some support to the laboratories for improvement.</li> </ul> </li> </ol>

GRUPO /GROUP	COMMENTS, RECOMMENDATIONS AND OBSERVATIONS
ROJO / RED	1. General <ul style="list-style-type: none"> <li>• Take into account the ECMR, which will help to complement the analysis of results.</li> <li>• Information about the types of testing methods, including its limitations, bias, precision among other criteria.</li> <li>• Communicate the limitations of proficiency testing programme referred to interpretation of information.</li> <li>• More detailed information about estimation of the homogeneity of the sample with its corresponding deviation standard calculation</li> <li>• Take into account the Harmonized Protocol "<i>Guide to proficiency testing for end users</i>" of IUPAC.</li> <li>• Information about different statistical tools and their interpretation.</li> <li>• Classification of dates in categories, as applicable.</li> </ul>

## 7. RESULTS

The main results achieved in this IV Workshop, taking into account the interchange of the information, support and activities are:

- Determination of components to consider in an accreditation system for proficiency testing provider based on the competence of the personnel, assessors and accreditation criteria.
- The representatives of participant entities (Accreditation Bodies, proficiency testing providers and laboratories) has acquired knowledge and training about the analysis and manage of dates got in a proficiency testing.
- Integration of the knowledge and competences of the participants from the IAAC members.

As concrete result of this cycle of workshops we have the organization of three proficiency testing and with that the development of competences about this subject by the participants.

However, in addition to that achievement, we had had the opportunity to work with a multidisciplinary group, we mean, representatives of Accreditation Bodies, Proficiency Testing Providers and Laboratories, each one of them with different interests and particular objectives. This situation propitiated we accomplish to some extent – trough the discussions and interchange of information – a better understanding of application and use of this technical tool, living value to the particular interests and objectives of the interested parties who participate or are related with proficiency testing.

The selection of the fields in which these three proficiency testing were executed, was based on the demand of participants. This situation guided us, in some cases, as clinical proficiency testing, to work in fields not so common and results let us confirm that still there is so much to do in this subject.

## 8. TASKS PROPOSED

After a discussion on the subjects covered, the group agreed in the establishment future work of defined activities, considering the difficulty level of them and its feasibility of application, it was proposed:

- a. Accreditation Bodies which have a management system for accredit laboratories; will give an adequate support to them in the use of proficiency testing.
- b. Permanent identification of potential proficiency testing providers, diffuse its existence among the accreditation bodies and the work with them.
- c. Permanent identification of potential reference material providers, diffuse its existence among the accreditation bodies and the Works with them.
- d. Accreditation Bodies communicate its needs about proficiency testing to the NMIs of its country, promoting a close work with them.
- e. Promote the use of proficiency testing, transmitting to users the relevance of its application.
- f. Development of a management system for accredit proficiency testing providers, alter evaluate some factors like demand, interest of the country in this subject and perspective of the Accreditation Body (Brazil, Mexico and others).

## 9. NEEDS PROPOSED

As product of activities in “Tasks Proposed”, the group propounded the following steps to follow in order to continue strengthening the proficiency testing component, living sustainability.

- a. Give support to the countries in the design and application of strategy for diffusing the relevance of proficiency testing in the commerce.
- b. Give support to the countries in the development of models of management systems for accrediting proficiency testing providers, specifically to those countries which are deciding to implement this accreditation scheme.
- c. Give training to potential proficiency testing providers, as national base for giving support in quality assurance of results.
- d. Give training to potential proficiency testing assessors.
- e. Give support to Accreditation Bodies and accredited laboratories in the use of proficiency testing.
- f. Continue working, seeking the integration the issues of proficiency testing with other subjects related as traceability and reference material.
- g. This leads us to seek a sustainable activity by part of IAAC in the organization of proficiency testing in fields of interest.
- h. Coordination of activities aimed to integrate IAAC and SIM, for instance in reference material subject, to support proficiency testing activities.

