

## THE FIOCRUZ/INCQS – INMETRO PROFICIENCY TESTING PROVIDED FOR BRAZILIAN PESTICIDE RESIDUES LABORATORIES



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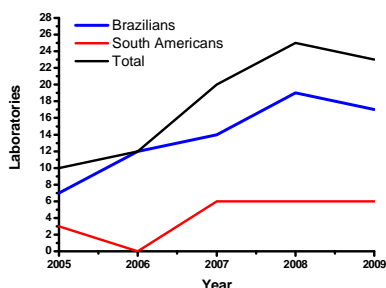
### 1. INTRODUCTION

The National Institute for Quality Control on Health of the Oswaldo Cruz Foundation of Brazil (Fiocruz/INCQS) from 2001 to 2004 patronized four Proficiency Testing (PTs) on pesticide residue in fruits and vegetables. Since 2005 several PTs have been carried out jointly by Fiocruz/ INCQS and the National Institute of Metrology Normalization and Industrial Quality (INMETRO). Analytes from seven different classes (Table 1) should be detected qualitatively and quantitatively in the PT samples sent to the laboratories.

**Table 1:** Analytes used in Brazilian Proficiency testing pesticide residue

YEAR	PESTICIDES
2005	Carbaryl, Parathion methyl, Diazinon and Ethion
2006	Ditiocarbamates (CS <sub>2</sub> )
2007	Deltamethrin, Ethion, Fenitrothion, Malathion and Permethrin
2008	Endosulfan sulfate, Fenitrothion, Procymidone, Tetradifon and Trifluralin
2009	Chorpyrifos, Fenitrothion, Oxyfluorfen, Permethrin and Trifluralin

At the beginning only eleven Brazilian laboratories participated in the Fiocruz/INCQS-INMETRO PTs. Nowadays, usually a little more than twenty Brazilian laboratories and five Latin American laboratories participate in these PTs (Figure 1). Three different crops were used for PT production: mango, papaya and tomato as showed in Table 2.



**Figure 1:** Participants Numbers in PT INCQS/FIOCRUZ-INMETRO

**Table 2:** Crops used in Proficiency testing Brazilian pesticide residue laboratories

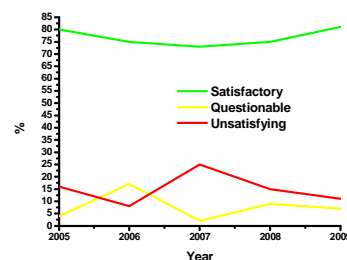
YEAR	CROPS
2005	Papaya
2006	Mango
2007	Mango
2008	Papaya
2009	Tomato

### 2. OBJECTIVE

The objective of this work is to show the results of five PTs thus far patronized jointly by Fiocruz/INCQS-INMETRO.

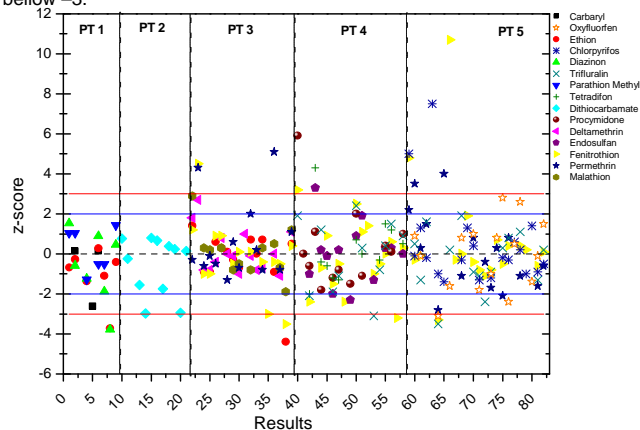
### 3. RESULTS AND DISCUSSION

The statistical evaluation of the reported results, initially, was based only on Z-scores. Since 2007 those works included reproducibility, analytical viability (AV), analytical capacity (AC) and dispersion graphs.



**Figure 2:** PT INCQS/FIOCRUZ-INMETRO

The observed Z-scores for five PTs are shown in Figure 3. It can be seen that the majority of the calculated z-scores (83%) fall between +2 and -2 or between +1 and -1 (55%), 7% were questionable. Only 10% of the calculated Z-scores were above +3 and below -3.



**Figure 3:** PT INCQS/FIOCRUZ-INMETRO results: 260

### 4. CONCLUSIONS

The results of this study demonstrate that pesticides of several classes can be analyzed satisfactorily by most of the Brazilian pesticide residue laboratories that participated in the INCQS-INMETRO proficiency testing. These results indicate, also, that efforts are needed by less than 10% of the participant laboratories to increase the quality of their measurements for the pesticide residue thus far analyzed.

### 5. REFERENCES

- ABNT ISO/IEC GUIA 43-1:1888: Ensaios de Proficiência por comparações interlaboratoriais – Parte 1. Desenvolvimento e operação de programas de ensaios de proficiência.
- Medina-Pastor P., Rodriguez-Torreblanca C., Anderson A., Fernández-Alba A. R. Trends Anal. Chem. 29 (2010) 70-83.

### 6. ACKNOWLEDGEMENTS

