

EDITORIAL

Highlighting the Importance of Data Treatment in Analytical Chemistry

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In recent decades, statistical analysis and data processing have become essential tools in Analytical Chemistry, ensuring reliable results from experimental data treatment. Some of the main statistical techniques used in this field include descriptive statistics, hypothesis tests, quality control of analytical measurements, calibration methods in instrumental analysis with a focus on regression lines, nonparametric and robust methods, experimental design, response surface methodology associated with the optimization of analytical methods, uncertainty evaluation and its application for compliance assessment, and chemometrics for interpreting chemical data.

These transversal approaches are widely used for solving problems in medical scenarios, environmental research, food security, pharmaceuticals, and more. It is crucial to emphasize that proper data processing requires a solid knowledge of statistics that remains grounded in the core principles of Analytical Chemistry to ensure the correct interpretation and reliability of the results.

This issue of BrJAC includes one letter, four articles, and one technical note, each featuring at least one statistical analysis and data processing method mentioned earlier in this editorial. Professor Tarley from the University of Londrina believes that chemometrics practiced in Brazil is on par with world-leading research centers. Professor Edenir Rodrigues Pereira-Filho from Federal University of São Carlos discusses the practical application of academic training to professionals in Brazilian industry. Renowned Brazilian researchers shed light on the importance of correctly expressing units of measurement in Analytical Chemistry, particularly considering the updated definition of the mole based on Avogadro's constant, following the International System of Units guidelines.

Additionally, Indian and Rwandan researchers have investigated the toxicity of methanol and ethanol, seeking to identify the origin and the frequency of methanol contamination in illegal alcoholic beverages in Rwanda, supported by performance figures in method validation. Indian researchers have developed a voltammetric method for measuring acetaminophen in oral suspensions, in which the accuracy and precision parameters were essential for establishing the study's reliability. This issue also features two optimization studies: the first validates a new method for isotopic determinations in beverages, while the second utilizes Box-Behnken design and Response Surface Methodology to optimize a method that uses hollow fiber microextraction and gas chromatography coupled to mass spectrometry for determining the presence of pesticides in postmortem whole blood samples. Finally, by using parametric and nonparametric tests and Principal Component Analysis, it was possible to infer that consuming diacetyl as a flavoring agent may pose health risks.

BrJAC reaffirms the enduring relationship between data treatment and Analytical Chemistry in its publications. This focus may have contributed to the recent increase in our impact factor from 0.7 to 1.1, indicating that we are on the right track!



Elcio Cruz de Oliveira has a degree in Chemistry from the Rio de Janeiro State University (1990), a Master's degree in Metrology from the Pontifical Catholic University of Rio de Janeiro (2001), and a Doctoral degree in Analytical Chemistry from the Rio de Janeiro Federal University (2008). He is currently a Professor of the Postgraduate Programme in Metrology, Metrology for Quality and Innovation, Pontifical Catholic University of Rio de Janeiro, and a Researcher in Petrobras S.A. His research activities include all areas of chemical metrology, but mainly related to the oil and gas industry.

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