



# THE MEANING OF TRACES #12

## Forensic science in question

### WHY USE QUALITY INSURANCE IN FORENSIC SCIENCE?



Traceability



ISO 17025 norm



ISO 21043 norm

Quality insurance allows for internal traceability inside laboratories as well as valuable and trustworthy data exchange between laboratories. It is a strategic tool, guaranteeing the respect of the chain of custody and the reliability of analytic results, both being fundamental conditions to accepting the experts' conclusions in criminal and civil cases. The ISO/IEC 17025 and ISO 21043 norms are the backbone of quality in forensic science. They specify "the general requirements for the competence, impartiality and consistent operation of laboratories".

## Quality management

Most forensic analysis methods used at IRCGN (the Gendarmerie Nationale's Criminal Research Institute) have been accredited by COFRAC (the French Accreditation Committee) following the letter of the ISO/IEC 17025 norm since 2009 (European Union Council framework decision 2009/905/JHA – deployed in 2012).

By guaranteeing rigorous and accurate results, it reinforces the credibility of criminal investigations. Quality management is done by qualified personnel who apply the recommendations of COFRAC via internal audits – the aim being to apply a quality policy and to clarify the organisation and the responsibilities of all parties, to control its realisations – and who ensure a harmonious evolution and improve the quality of the services rendered by IRCGN (e.g. the experts' missions).

Quality  
supervisor

Audits

Rigour

In "Quality management in forensic science: A closer inspection" (2023), Wim Neuteboom and his co-authors recognise the advantages of ISO 17025, but also point out its limitations, proposing ways to improve quality management in forensic science.

Indeed, there is a reflection taking place at the moment aiming to better regulate forensic actions (ISO 21043 norm), going further than just the analytic issue – which is the only one covered for now – in order to cover trace collection as well as result interpretation.



## Survey

Between 18/01/2024 and 30/01/2024, we contacted some of you to get your opinion about the content and format of this newsletter. First, we want to thank those of you who took the time to answer the form. We learned from it that this newsletter mostly meets your expectations. While two parts: "Surprising" and "Forensic science in fiction/in action" appear superfluous to some, none find them undesirable. This newsletter will thus remain as is for now.

However, should you have any remarks or suggestions, do not hesitate to [contact us at this address](#)



## Scientific publications

**A review of the current quality standards framework supporting forensic science: Risks and opportunities.** Doyle, S. (2020). Wiley Interdisciplinary Reviews: Forensic Science, 2(3), e1365.

**Quality Management in forensic science: A closer inspection.** Neuteboom, W., Ross, A., Bugeja, L., Willis, S., Roux, C., & Lothridge, K. (2023). Forensic Science International, 111779.

**Quantitative color analysis of burned bone to predict DNA quantity, quality, and genotyping success.** Macias, E., Hartline, K., Buzzini, P., & Hughes, S. Journal of Forensic Sciences.

**L'expertise en écriture et documents : partie prenante de la science forensique,** Revue n°172, février 2024.

**Automated interpretation of comparison scores for firearm toolmarks on cartridge case primers.** Baiker-Sørensen, M., Alberink, I., Granell, L. B., van der Ham, L., Mattijssen, E. J., Smith, E. D., ... & Zheng, X. A. (2023). Forensic science international, 353, 111858.

**Homicides committed by women with mental disorders: A descriptive study conducted in a French secure unit.** Kazemian, K., Raymond, S., Azoulay, M., & Gasman, I. (2023). Journal of forensic sciences, 68(2), 568-577.

**Forensic-led regulation strategies: are they fit for security problem-solving purposes?** Crispino, F., & Roux, C. (2017).

**The Routledge international handbook of forensic intelligence and criminology.** Rossy, Q., Décary-Hétu, D., Delémont, O., & Mulone, M. (Eds.). (2017). Routledge.

### Surprising



La concentration de cocaïne dans les saisies a augmenté de 20% en 10 ans en raison de la forte production récente de cette drogue, ce qui a conduit les producteurs à réduire la coupe pour écouler leurs stocks. Les consommateurs se retrouvent donc avec une cocaïne plus concentrée.

Source: *toxicology department, IRCGN.*

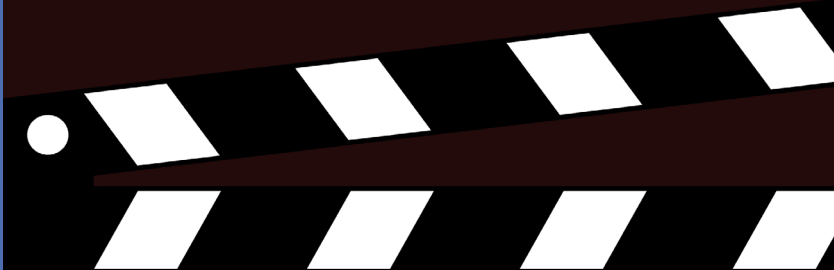


## Forensic science in fiction

In season 4 episode 10 of Breaking Bad, Jesse goes to Mexico to teach cartel scientists how to make his brand of methamphetamine.

An argument erupts between both parties as Jesse considers the lab too dirty and not respectful of the standards necessary for quality work.

After more than a night of work, the resulting product is tested via spectrometer to assess its purity: the cartel is satisfied, but Jesse understands that he will have to continue working for the cartel.



## Forensic science in action



The cleanliness of laboratories is an important element of the quality management process. Indeed, pollution and contamination of any sort are to be avoided when looking to craft the purest product possible. Cleanliness is a necessary condition, but it is not enough in and of itself. In order to certify the validity of results, the machines that are being used have to be rigorously calibrated and periodically checked. The people working those machines also need to be specifically qualified and they must keep their knowledge up-to-date.

Mastering all these elements allowed IRCGN to conceive and build mobile genetic analysis laboratories allowing for trace analysis as close as possible to the facts, all the while respecting the processes guaranteeing the quality of the work being done.