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WG. 2.3. Estimation and use of LoD and LoQ in targeted and non-targeted analysis.

Chair

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Outline

- Introduction
  - Who is present?
- Small presentation on LoD
- Discussion

Audience

- 40 participants
- Universities (50%)
  - Students (8)
- Metrology institutes (2)
- Industry (7)
- Governmental labs (6)

3

Q: if I do not have blanks?

- For the estimation of CC_β and CC_α blanks are required
- In metabolomics the blanks are mostly not available
- At least procedural blanks should be used
- Use calibration curve
  - Assume that the standard deviation is the same for blanks and the spiked samples

4

Q: is LoD meaningless in non-targeted analysis?

- Relay on comparable data (historical data)
- Maybe we should talk about limit of detection for the identification
- Calculating limits on the intensity level
  - Blank sample – it needs to go through the whole process
  - Already procedural samples have a lot of peaks

5

Q: LoD in non-targeted

- Is intensity enough?
- Do we need qualifier and quantifier?
- There is a method available, where different criteria are summarized (points)

6

Q: what can we learn from qualitative analysis?

- How close are we to the regulatory limits
- LC/HRMS
  - A lot of compounds we already know
  - For these we can establish LoD/LoQ
  - Gives indication for other compounds (semi-quantitative)
  - Sometimes sufficient starting point for the client/scope
  - We need to educate the client as well
- We still need standards to establish the LoD

7

Q: software limitations?

- Sometimes relative intensity values
- Orbtrap cuts the background
  - S/N can not be calculated that
- Some instruments set the thresholds

8

Discussion - definition

- Should LoD be defined more specifically in guidelines?
  - Should CC_α and CC_β be used instead of LoD?
- Feeling that there should be a more specific guidelines
- The change in terminology is a bit confusing
  - Especially for the clients
- In veterinary field CC_α and CC_β are very well established
  - It is extremely important in the screening methods
- Vicky asks everyone to give feedback through Eurachem website

9

Q: At what concentration levels should I fortify?

- 5- to 10-times below the regulatory limit (MRL)
- Lowest level and account for matrix
- Depends on the homo- or heteroscedasticity
  - Is not that important in case of homoscedasticity
- Standard deviation of residuals

10

Q: how often do we determine LoD/LoQ?

- Depends on the method
  - How often is the method used
- Control charts are used
- Is the calibration also re-run or not
  - Both possibilities have been used
- How do I manage the change or variation for day to day?
  - We set it above and use QC to be sure that we are on the safe side every day
  - Verify every day

11

Q: using prior knowledge

- Is not used currently
- We would need reference materials
- Assume that the sample belongs to the same population as the prior samples
- Information shearing can be useful to flag problematic matrices etc.
- Validation need to be done in a lot of matrices that are under the scope of the method

12

Q: LoQ for methods that estimate sum of compounds

- Problematic
- Reporting the range
- A general discussion on validation of such methods

13

Some new thoughts

- Uncertainty is in the CC_α and CC_β values
- And this is already in the guideline 2002/657/EC

14

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30

Thank you!

15