Survey on Dithiocarbamate Residue Analysis

The French NRL for Pesticide Residues and the EURL-SRM conducted in 2022 an online-survey to find out

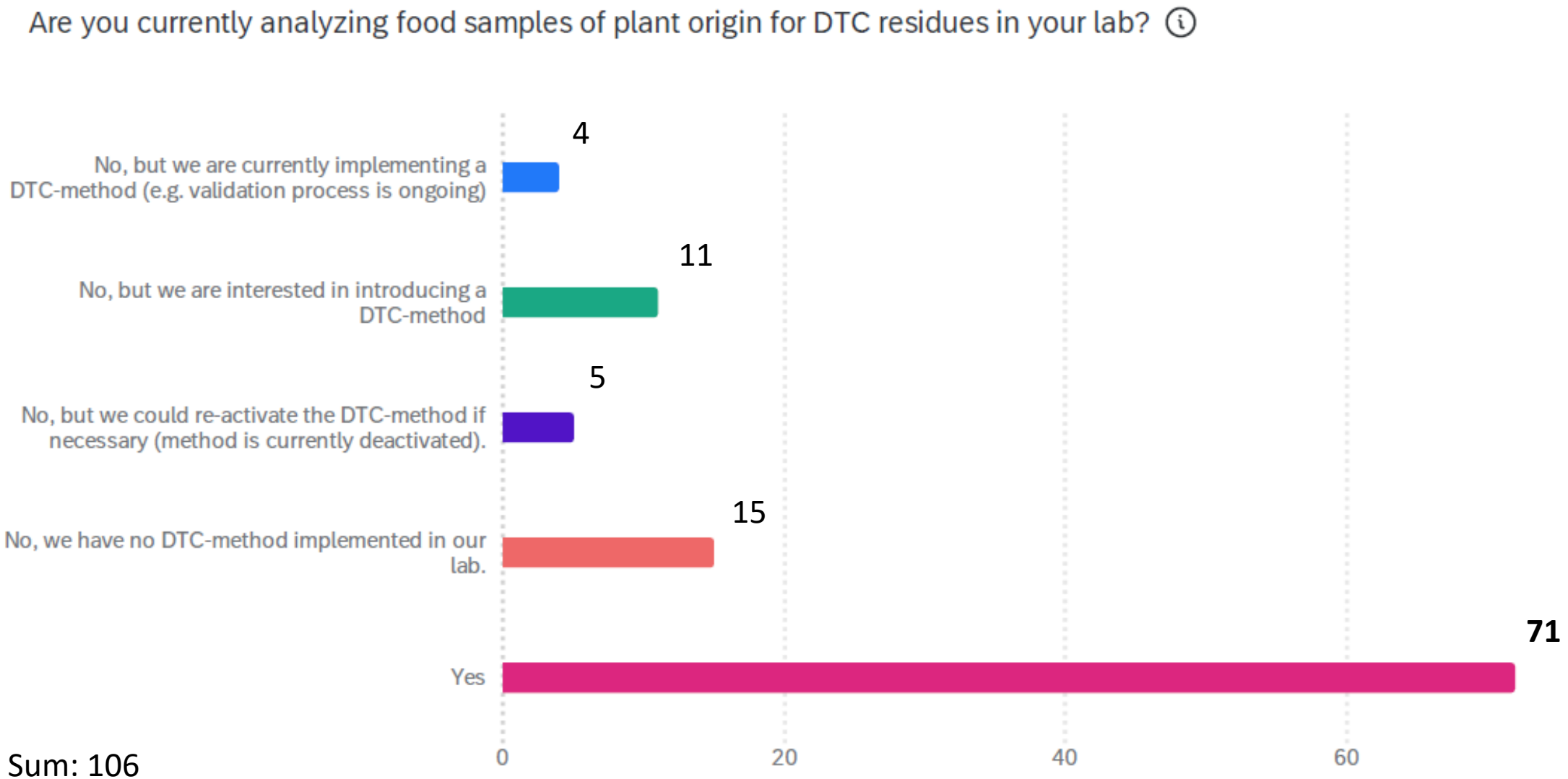
- **how many EU-OfLs routinely analyze for DTC residues**,
- **what kind of methods are used for this purpose**,
- **which criteria are applied for selection of samples,**
- **participation in a working group** for sharing experience and/or knowledge on DTC residue analysis.

Number of invited labs: 204
Number of participants: 106

The following slides show the questions and the answers given by the participants.

Results of the online-survey on dithiocarbamate residue analysis

Conducted by EURL-SRM and French NRL-SRM (2022)



Sum: 106

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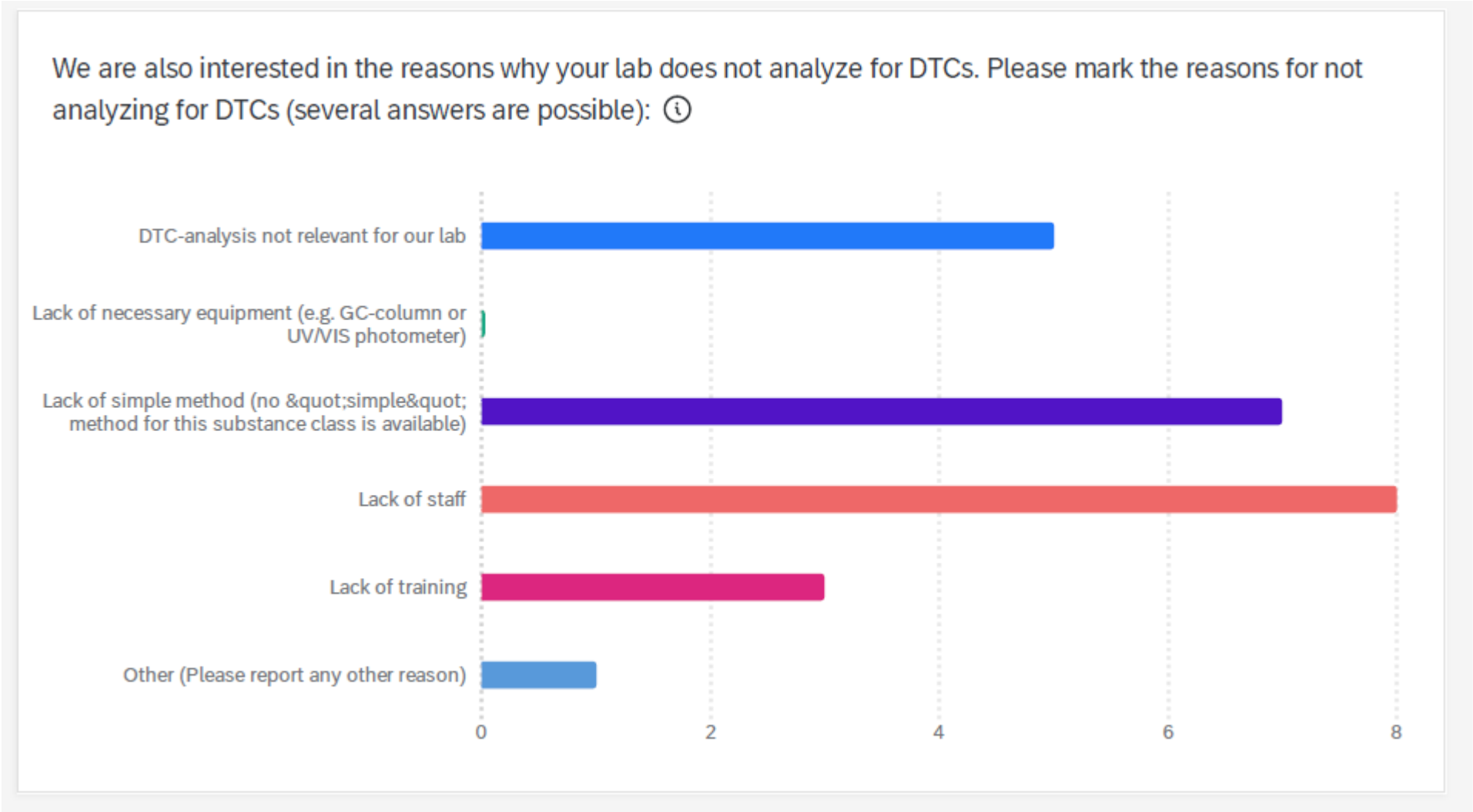
If the answer was: „No, we have no DTC-method implemented in our lab. “



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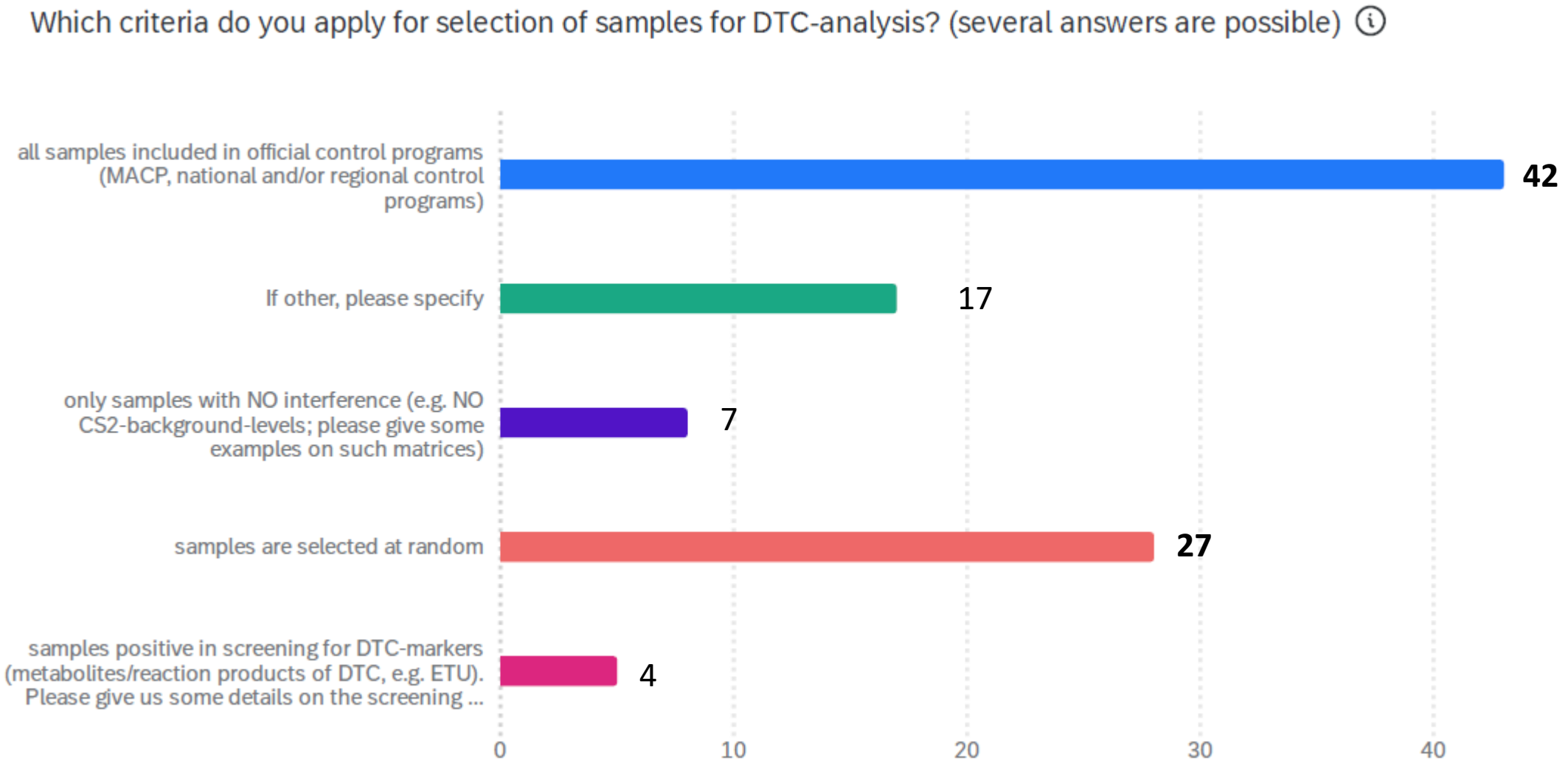

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Which criteria do you apply for selection of samples for DTC-analysis? (several answers are possible) - If other, please specify - Text

We do all the samples in the EU three year rolling plan plus all infant formula, milk and babyfood
6x at the customer's request
all samples
when required by official control programs or when an application can be expected
No routine samples (development tests are performed in the framework of our NRL activity)
THE SAMPLES ANALYZED ARE APPLES AND PEARS BECAUSE IN OUR COUNTRY THEY ARE THE PRODUCTS ON WHICH THEY ARE MOST USED
We measure DTC routinely when measuring fruits and vegetables
Samples of MACP, where it is required (specified).
only samples of the coordinated multiannual control programme and 5 - 10 samples of wine grapes per year
We select those samples for DTC-analysis, for which the DTC-Analysis is required by the food Monitoring plan. In Addition to that we analyze DTC in all organic food samples as well as in berries, stone-fruit, salads, spinach and cabbage.
All plant species that are allowed to be treated with DTC type compounds and plant-based food matrices as well.

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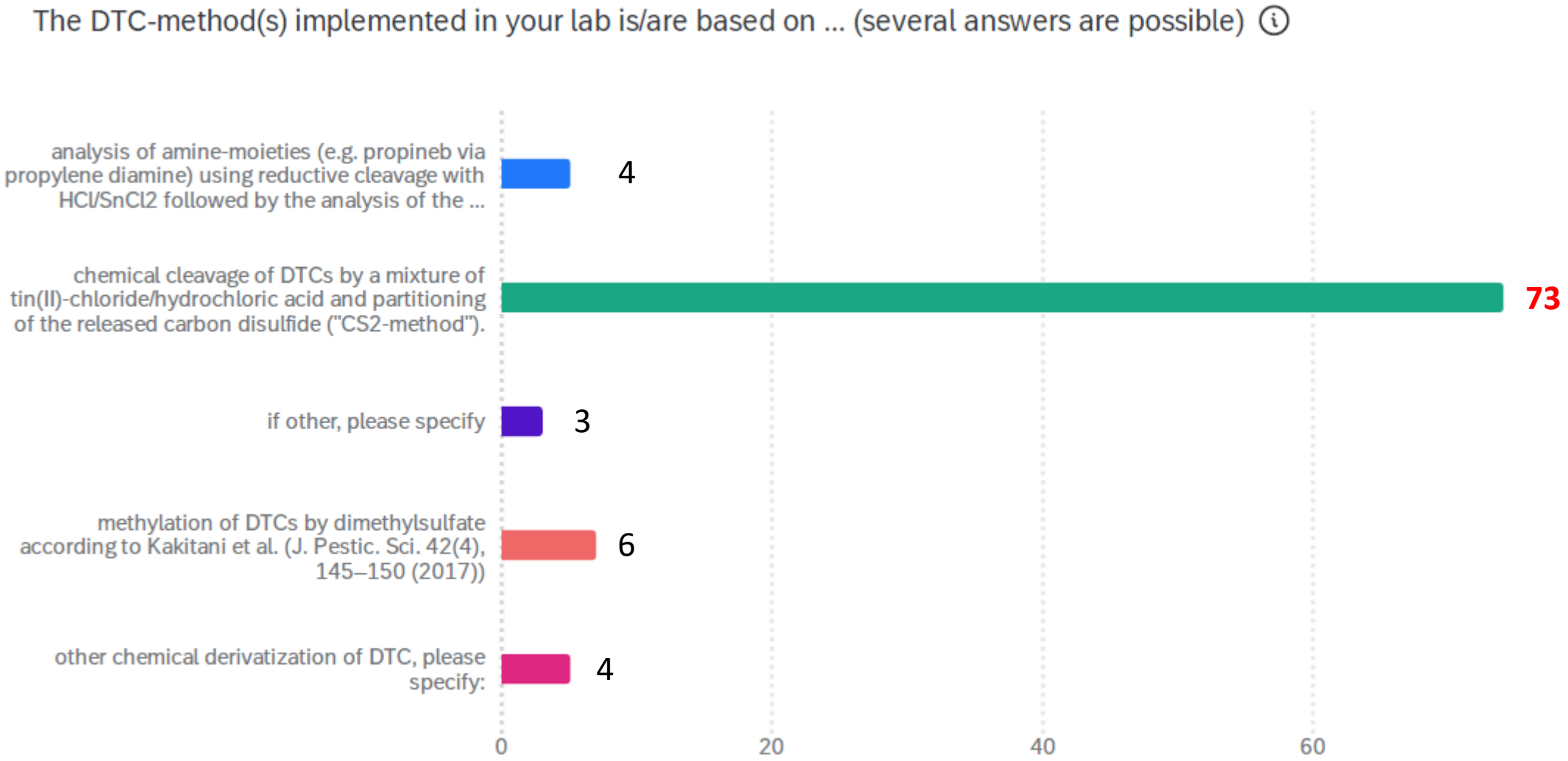

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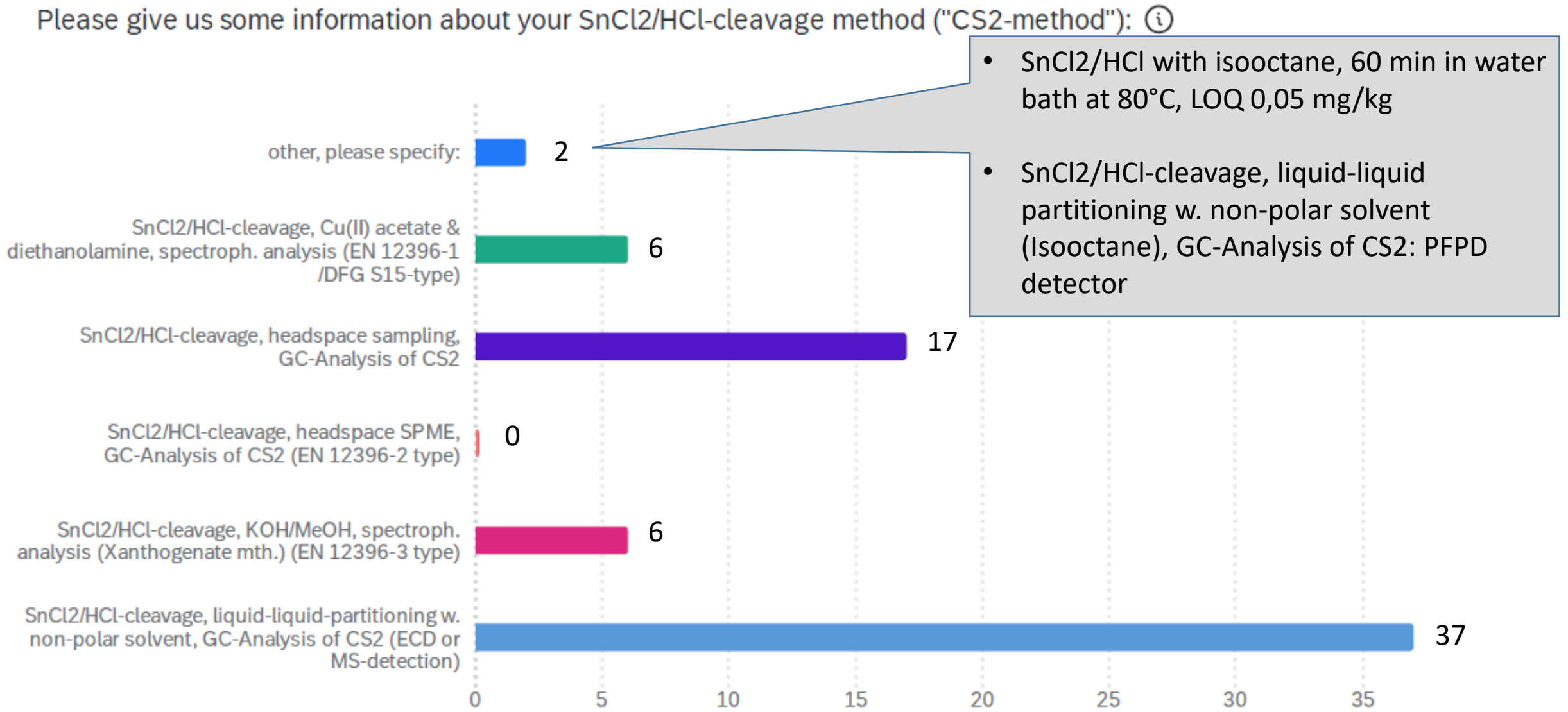

- SnCl2/HCl with isooctane, 60 min in water bath at 80°C, LOQ 0,05 mg/kg
- SnCl2/HCl-cleavage, liquid-liquid partitioning w. non-polar solvent (Isooctane), GC-Analysis of CS2: PFPD detector

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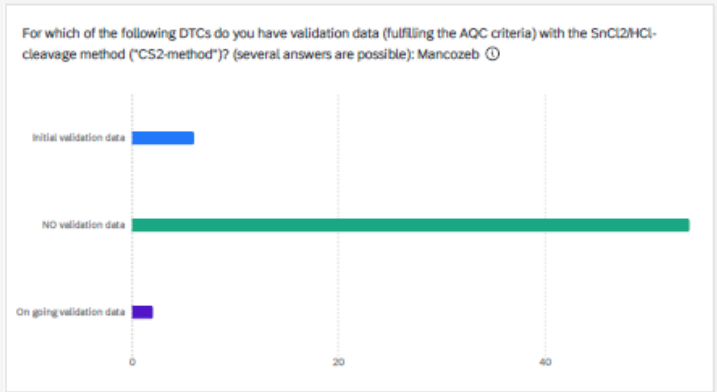
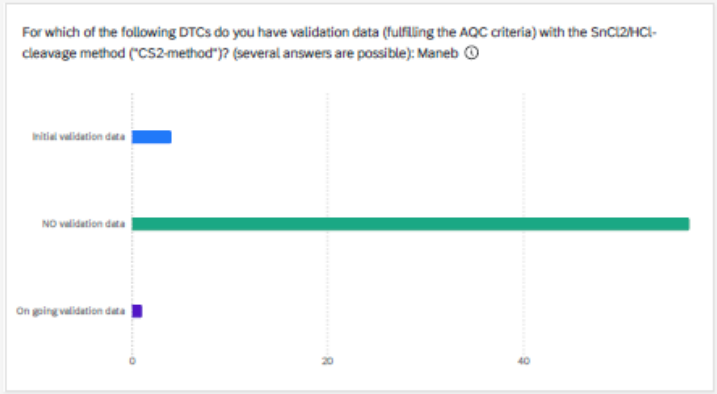
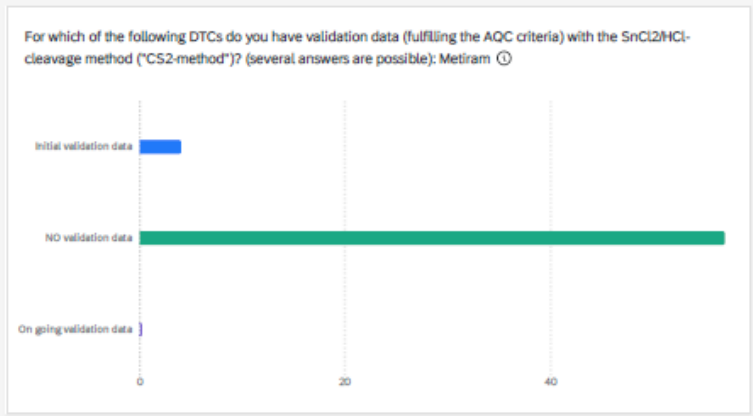
CS_2-Method

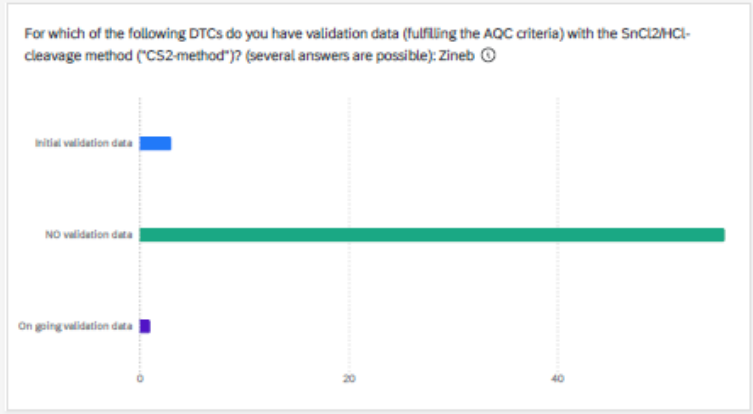
- NO validation data for **mancozeb, maneb, metiram, zineb, mancopper, propineb, ziram**

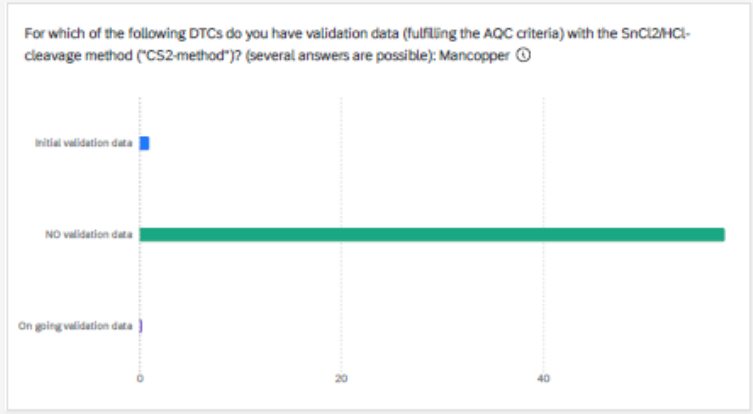
- ongoing validation data for thiram

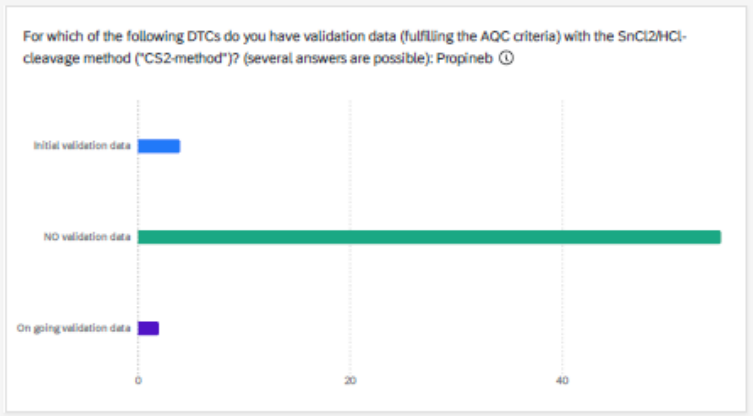


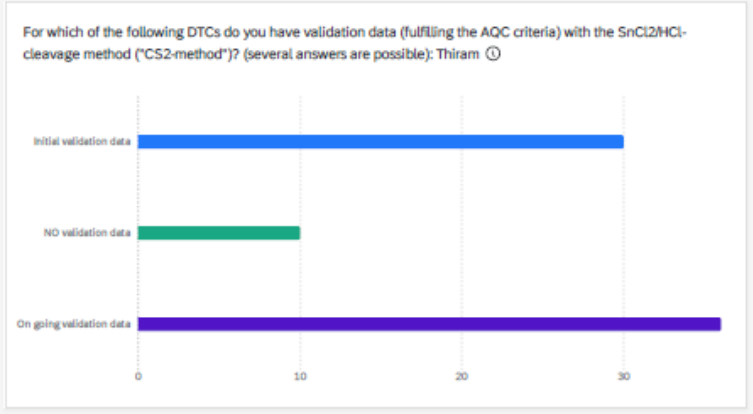


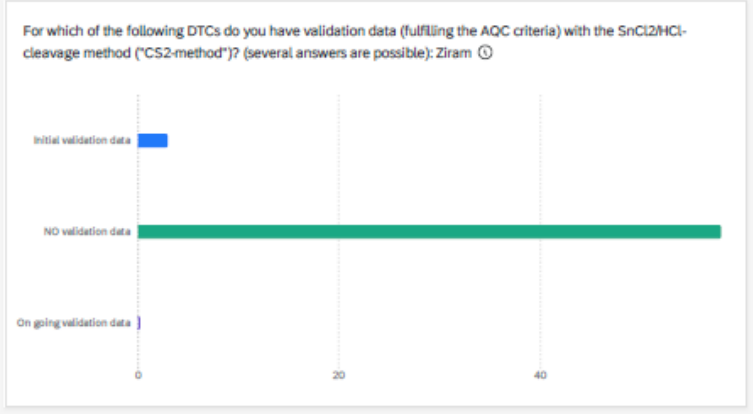












Results of the online-survey on dithiocarbamate residue analysis

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Kakitani-Method

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Mancozeb

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Maneb

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Metiram

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Zineb

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Mancopper

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Propineb

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Thiram

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Ziram

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Kakitani-Method

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Ferbam

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Other DTCs (please give names of the substances)

For which of the following DTCs do you have validation data (fulfilling the AQC criteria) with the methylation method according to Kakitani et al. (J. Pestic. Sci. 42(4), 145–150 (2017))? (several answers are possible): Other DTCs (please give names of the substances)

Please give us some detailed information about the methylation method according to Kakitani et al. (derivatization conditions, typical LOQs [mg/kg], ...)

asd

Same conditions as in the Kakitani's method (stabilization/solubilisation of DTC with NaHCO3 and DTT, methylation by dimethylsulfate, QuEChERS extraction) Tested on propineb, mancozeb and ziram in brocoli Procedural calibration (in matrix and in solvent (H2O)) LOQ of 0,002 mg/kg of propineb and mancozeb seem achievable ; LOQ of 0,02 mg/kg of thiram seem achievable on the quatification transition, but needs improvements on the qualification transition).

LOQ - DDMe expressed as CS2 : 0.006 mg/kg - EBMe expressed as CS2 : 0.002 mg/kg - PBMe expressed as CS2 : 0.002 mg/kg

Keine weiteren Ergebnisse anzuzeigen

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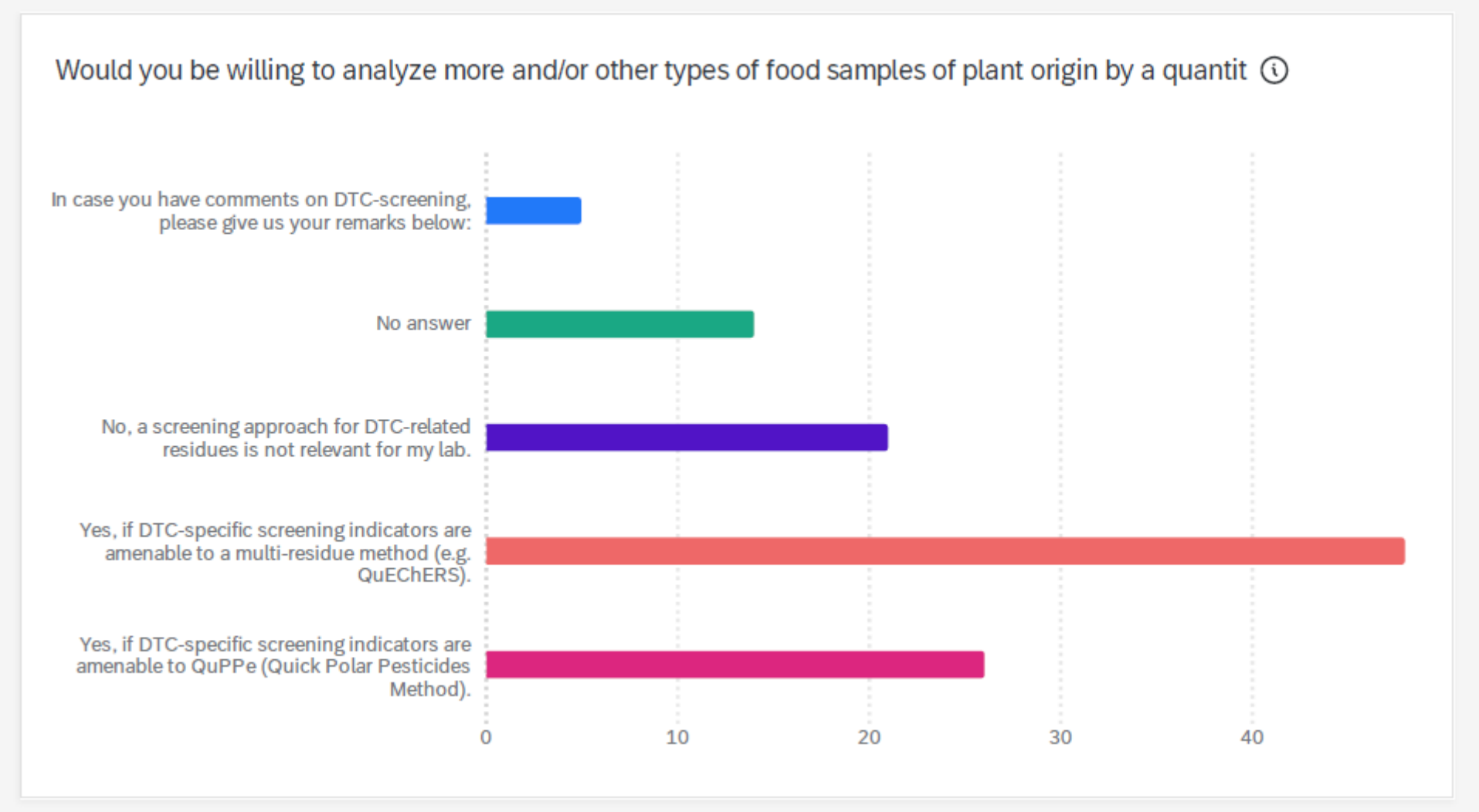

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Would you be willing to analyze more and/or other types of food samples of plant origin by a quantit: In case you have comments on DTC-screening, please give us your remarks bel...

We are very interested in implementing a DTC-screening approach, nevertheless we do not have equipment available for this purpose

We tried to sreen eBIC and pBIC (GC-MS/MS) but sensitivity was too low

When doing a screening first on more samples during QuEChERS, problems with CS2-analysis have to be considered for all those sample (including sample preparation and comminution without degradation, comminution and storing/freezing without formation of CS2; weighing without additional thawing,...) That will make sample handling/preparation and storing more complex.

But only, if that is acceptable by EU legistation.

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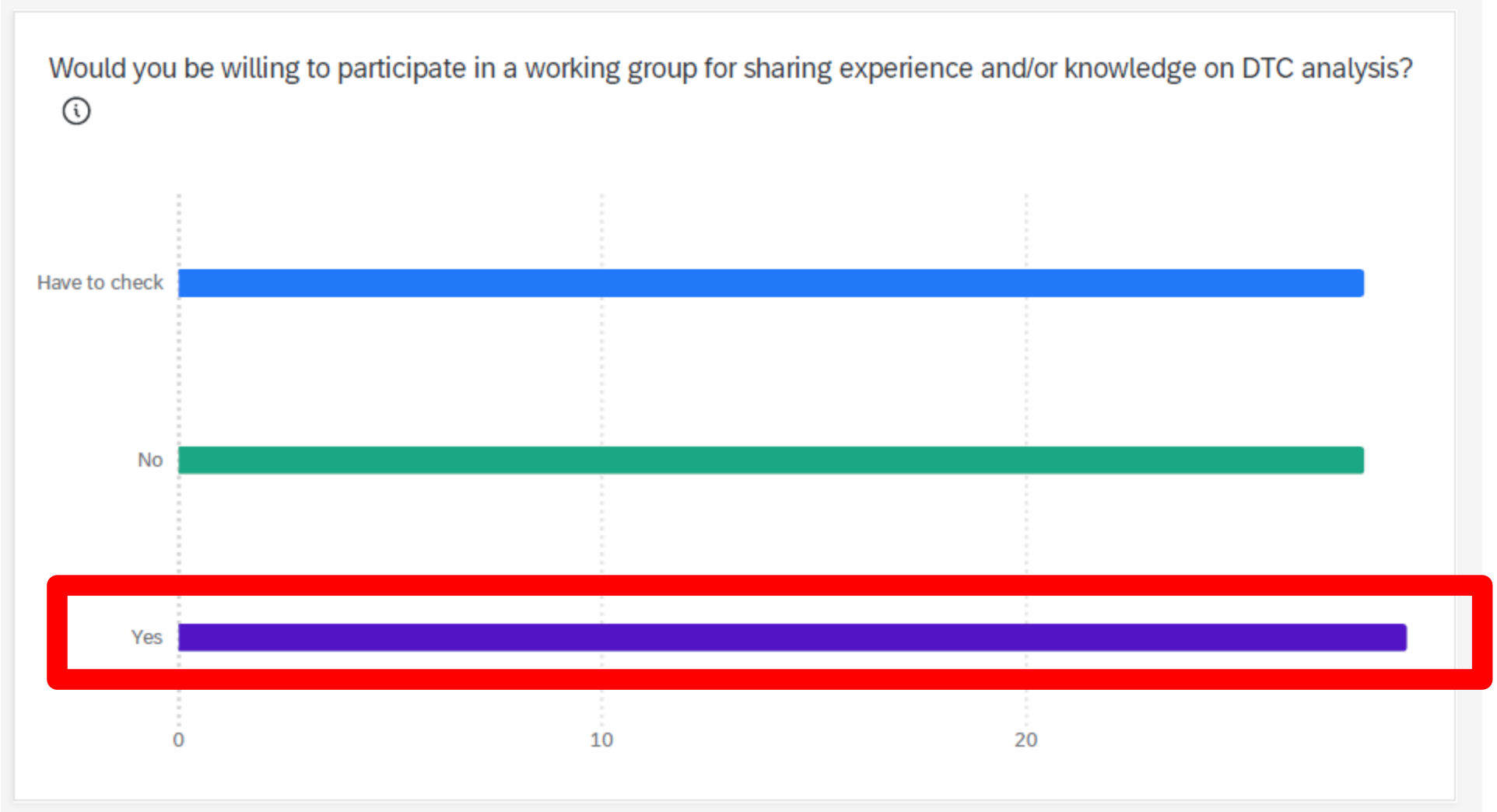

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What are your expectations on such a working group (e.g. to work on confirmatory methods, ...)?

To know more about DTC-screening approaches, which of them could to be used in GC-IT-MS/MS, to work on confirmatory methods, how to deal with commodities with interferences.

Screning method and improves in the quantitative method

It could be necessary to find a new method of dithiocarbamates analysis.

work on screening methods work on miniaturisable, time-effective and automatable methods work on confirmatory methods

To learn more about analysis of DTC, matrix interferences and possibilities to overcome. Using other technique instead of GC-MS. Using HR-GC-MS or LC-MS/MS or even HPLC-ICP-MS.