

# PRIMORIS

YOUR RELIABILITY IN FOOD ANALYSIS

Sampling and analysis as an inspection  
tool: Possibilities and limitations

**A Lab Perspective**

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# Agenda

- 🌱 Sampling in organic inspection and control
- 🌱 Analysis plan
- 🌱 Presence of non-authorised substances
- 🌱 Take home message



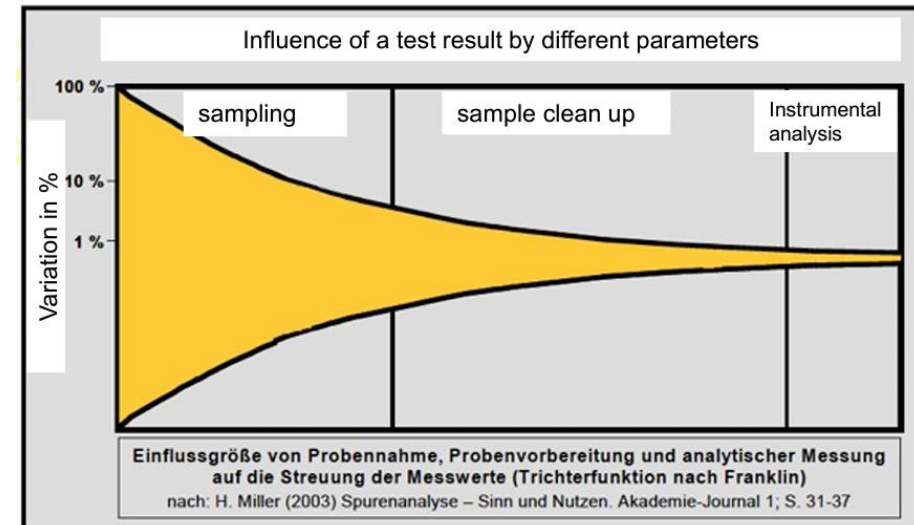
# Sampling in organic inspection & control

- ① The analysis process
  - ① Starts with the sampling
  - ① The analytical result on the report represents the sample!
  - ① Plausible control -> non harvested parts of the plant!
- ① Sample packaging and transportation
  - ① Time between sampling and analysis
  - ① Packaging avoiding
    - ① cross contamination
    - ① Loss of substances
- ① Sampling report including documents, photo's, ...



# Sampling

- 🍃 Same lot but different samples, different results, ...
  - 🍃 Time line?
  - 🍃 Same Lot?
  - 🍃 Processing changes?
  - 🍃 Representative sampling?
  - 🍃 Analytical variability





# Analysis plan

- ① Efficient control of organic products
  - ① Focus on possible presence of non authorised substances
    - ① In general
      - Per commodity -> authorised substances of conventional production
    - ① In case of indications of specific substances
      - Focus on the specific substance
  - ① Focus on other food legislation (contaminants in R 1881/2006)
  - ① Design of a specific analysis plan
    - ① 100 % control = technically impossible
    - ① 99 % control = unaffordable



# Analysis plan

## ① Cost effective control

① Based on knowledge of conventional production

① Based on

① the lab's experience per commodity

① operator's and CB's critical control point knowledge

① Starting point = LC-MSMS & GC-MSMS multi methods (500 – 600 pesticides)

① Complemented per commodity with specific methods

- Glyphosate on lentils
- Dithiocarbamates on avocado
- Ethephone on pineapple
- ...





# Analysis plan

## Other considerations

- Time pressure in food business is HIGH
- Pré-shipment analysis is used in trade as additional check of compliance
  - No result = no trade
  - Positive result = no trade (no time for proportionate investigations)
- Non regulated metabolites  $\neq$  proof of use
  - AMPA (glyphosate) on potato
  - HEPA related to ethephone



# Presence of non-authorized substance

- ① Presence = official investigation
- ① Check compliance with Regulation 396/2005
  - ① If result > MRL -> product is not marketable
  - ① If result < MRL compliance with Regulation 2018/848
    - ① Proportionate investigation
- ① Investigation
  - ① based on common knowledge?
  - ① Wild goose chase?



Footnote: check **Relana** website: [position paper 19-01 on contaminations](#)





# Presence of non-authorized substance

## 🌿 Analytical problematic : Dithiocarbamates

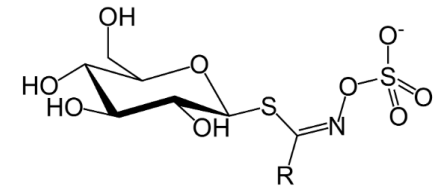
🌿 EU residue definition: dithiocarbamates expressed as CS<sub>2</sub>, including maneb, mancozeb, metiram, propineb, thiram and ziram)

🌿 Current general analytical approach: destruction to CS<sub>2</sub> followed by CS<sub>2</sub> determination

🌿 Detects also S-containing compounds in Brassicaceae, allium, ...

🌿 CS<sub>2</sub> positive but no dithiocarbamate usage

🌿 Regulation 396/2005 under review for these commodities

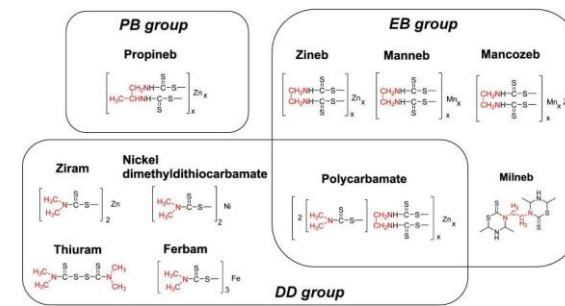


🌿 Detects also S-containing compounds in latex and nitrile gloves

🌿 CS<sub>2</sub> positive but is a sampling contamination -> check gloves before usage!!

## 🌿 Analytical solution under development

🌿 Primoris together with French NRL's and official labs





# Presence of non-authorized substance

- ① Natural presence : Bromine
  - ① Residue of methylbromine use
    - ① In general findings > 5 ppm
  - ① Naturally present
    - ① Low concentrations in celery and cinnamon
    - ① Moderate concentration in walnuts and brazil nuts
    - ① Lower the LoQ -> more positive findings



# Presence of non-authorized substance

## Environmental presence

### DDE and DDD as metabolites of DDT

- Ultra stable molecules (DT50 > 10 years)
- Omni present (also in soil) -> Organic farmers are in conversion the next 50 years if these compounds would be considered
- Findings in
  - Tarragon, zucchini, ... -> accumulation
  - Essential oils -> concentration process

### Anthraquinone

- Bird repellent
- Environmental presence and processing issue -> PAH like molecule
  - Dried herbs, spices and tea -> contamination by drying process

SpringerLink

Original Paper | [Open Access](#) | [Published: 17 July 2022](#)

Persistent organic pollutants and mercury in a colony of Antarctic seabirds: higher concentrations in 1998, 2001, and 2003 compared to 2014 to 2016



LWT  
Volume 170, 1 December 2022, 114021



Influence of different drying methods coupled with different process modes on physicochemical qualities and anthraquinones contents of *Rheum*



# Presence of non-authorized substance

- ① Common production knowledge
  - ① Non compatible crop/pesticide combination
    - ① Glyphosate on leafy vegetables
  - ① Pesticide found is not a plant protection product
    - ① DEET
    - ① Icaridin



# Take home message



- ④ Correct sampling in view of the risk of the product and its supply chain
- ④ Risk based analysis plan maximizes the possibility of finding non authorised (used) substances
- ④ Certain substances are
  - ④ not an indicator of non-authorized use or fraud
  - ④ Their time consuming investigations are
    - ④ not contributing to compliance evaluation
    - ④ restricting trade of organic products

