Good implementation practices for Articles 28 and 29 of Regulation (EU) 2018/848

Handles, keys and levers for investigation of residue cases in EU organic production

Open discussion on the concept and the content

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Table of Content

Introduction
Chapter 1: The most common contaminants found in organic production
Chapter 2: Laboratory analysis: the main tool for detecting of contamination

**Chapter 3: Potential sources and causes of contamination**

Chapter 4: The toolbox for investigation methods and techniques
Chapter 5: Systematic approach for official investigations
Chapter 6: The role of the different actors in the investigation.
  6.1: Assessments conducted by the operator (Art. 28)
  6.2: Investigations conducted by the control bodies (Art. 29)
  6.3: Investigations conducted by the competent authorities (Art. 29)
  6.4: Information exchange including cross-border communication (OFIS)

Chapter 7: Decision making
Conclusion
Chapter 3: sources and causes

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1 Why is it important to know the potential sources and causes of contamination?

Sources and causes

(Routine production)

Precautionary measures

Residue case

Base for good investigation

Base for sound decisions on the status of products and operators
2 Major sources, causes and contamination pathways

2.1 Use
- Substance was applied in the organic operation (reasons: see later chapters; more details in the guideline)

2.2 Commingling
- Non-organic product (to which the substance was applied) is commingled/exchanged with an organic product (reasons: see later chapters; more details in the guideline)

2.3 Internal contamination (also known as ‘cross-contamination’)
- Organic product is contaminated in the installations or equipment of the operator, or in packaging / containers which are not under the control of the operator (example: phosphine in cereals and other dry food)
2 Major sources ... (continued)

2.4 Environmental contamination

- from the air, distance typically 1-100 m („classical drift“, overspraying)
- from the air, distance up to 1000 km (long-range drift)
- from the soil („heritage chemicals“ deposited before conversion; best-known example: organochlorine pesticides taken up by cucurbitaceae)
- from water
- heritage in woody plant parts of perennials (e.g. phosphonic acid)
2 Major sources ... (continued)

2.5 Natural source

A number of substances which may be used as pesticides also have alternative origins unrelated to pesticide use (natural occurrence, metabolized by plants, formed during processing...).

- Example I: anthraquinone in tea
- Example II: bromide
  (remark: if it comes from sea spray, it could also be considered as ‘environmental contamination’)

(2.6 non-confirmed residues)

Some reports of residue findings are not confirmed, when further investigated.

- Contaminated sample
- Analytical mistakes
Many contamination pathways are possible!

Figure from Schleiffer and Speiser (2022). https://orgprints.org/id/eprint/44485/
3 Characterization of major sources, causes and contamination pathways

3.1 Intentional use

Considerations in case of a residue finding:

• Intentional use always aims to solve a specific production problem. Would the application of the specific substance have any agronomic benefit on the crop on which it was detected?

• Can residues of the pesticide be found on the spraying equipment?
3 Characterization of major sources... (continued)

3.2 Drift

- Can occur in almost every crop and with almost every pesticide
- The extent of drift depends mainly on
  - distance to nearest conventional neighbour plot
  - Type of neighbour crop (orchard / wineyard / field crop)
  - Spraying methods on the conventional neighbour plot
  - Wind

- When drift occurs, residues are usually much higher in the immediate vicinity to the neighbour plot than in the middle of the organic field
3 Characterization of major sources... (continued)

3.3 Soil contamination

- Frequent example: uptake of OCP (‘organochlorine pesticides’, e.g. lindane, DDT) by cucurbitaceae (cucumber, pumpkin, etc)
- Not very common in other crops and with other pesticides (occasionally issues with root crops and dieldrin)
- Only with poorly degradable pesticides
- In Europe, OCP were withdrawn from the market several decades ago
3 Characterization of major sources... (continued)

3.4 Natural source I: Anthraquinone in tea

• Anthraquinone has been used as a seed treatment (bird repellent)
• Anthraquinone is also formed during incomplete combustion, and is thus a natural constituent of smoke
• As a traditional manufacturing method, tea leaves are dried over fire (contamination risk by the smoke)
3 Characterization of major sources... (continued)

3.4 Natural source II: Bromide

• Inorganic bromide is a metabolite of methyl bromide, which can be used as insecticide in stock protection, or as soil nematicide.
• Inorganic bromide is also a natural constituent of all animals, plants, soils and water.
• Bromide levels are naturally elevated in sea water, and therefore also in coastal areas.
• Marine-derived fertilisers (seashells, seaweed extracts, etc.) naturally contain elevated bromide levels.
• Bromide levels are naturally elevated in certain volcanic soils.
• Some crops naturally concentrate bromide (e.g. Brazil nuts)
Chapter 3: sources and causes

4 Sources and causes in the overall process

- Different sources and causes
  - Different precautionary measures
  - Different investigation methods
    - Influences decision on marketing as organic

Sensitive & complex issues

- Multitude of substances and situations
- Incomplete knowledge

Challenges

- This presentation can only highlight a few selected situations
- The corresponding chapter in the guideline aims to be complete. To what extent we can achieve this ambitious aim is open at the moment.

Thank you for your attention!