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Organo Rice
ISOP 2025

Standardization and innovation in organic testing from international standards to applications in Asia and Vietnam

Nguyen Thi Phuong Vi

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I. Regulatory Frameworks for Organic Products

II. Applying International Testing Methods –
The Role of Testing in Organic Food Products

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I. Regulatory Frameworks for Organic Products

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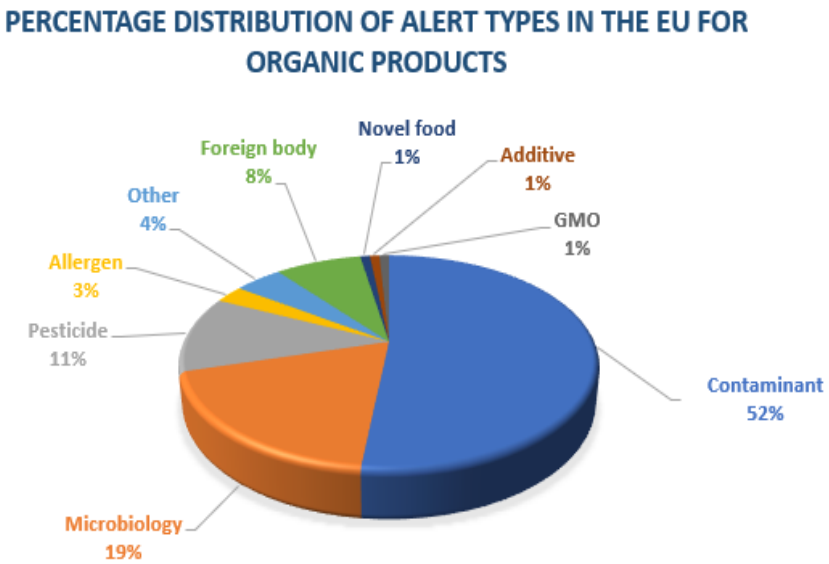
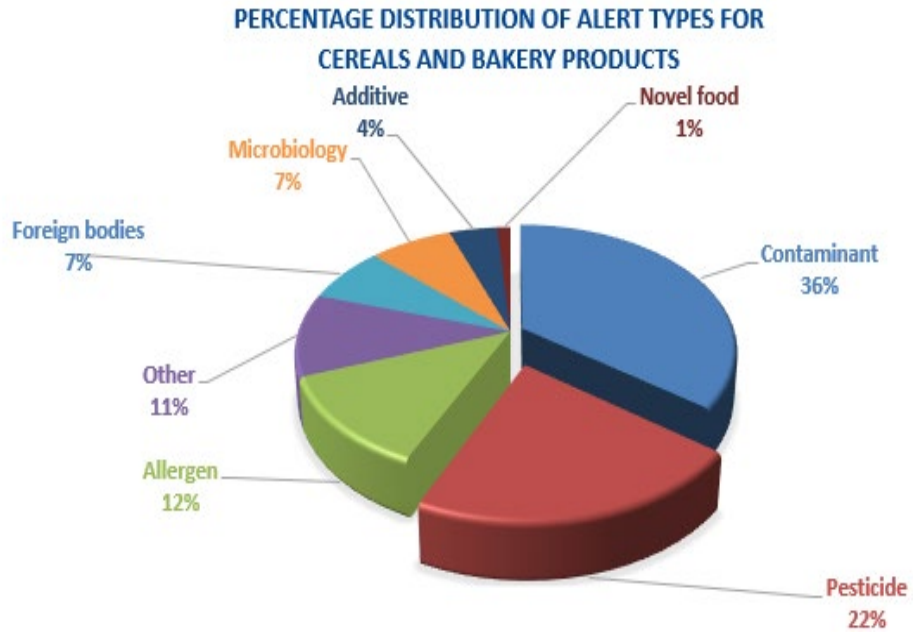
Food Safety Highlights of Organic Products





Source: RASFF

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Regulatory Frameworks

- No use of pesticides
- No genetically modified organisms (GMOs)
- No chemical fertilizers
- No growth hormones
- No synthetic preservatives or additives
- No sewage sludge
- No antibiotics
- No irradiation

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Regulatory Frameworks

- **US – 7 CFR Part 205** National Organic Program
  - 188 Prohibited Pesticides for NOP Residue Testing
  - 10 Nonsynthetic substances prohibited
- **EU - (EU) 2021/1165**
  - Basic substances shall not be used as herbicides
  - Low-risk active substances
  - Micro-organisms
  - Active substances approved may be used as plant protection products in organic production

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USDA_Instruction Responding to Results from Pesticide Residue Testing

- **No detected residues**

  Notify the certified operation
  + may be sold as organic

- **Residues Detected at Less than 0.01 ppm**
  - Notify the cert operation + may be sold as organic
  - Assess why the residue is present and follow up with operation as appropriate

- **Residues Detected at or above 0.01 ppm**
  - EPA Tolerance is Established
  - No EPA Tolerance, FDA Action level Exits
  - No EPA Tolerance or FDA Action level

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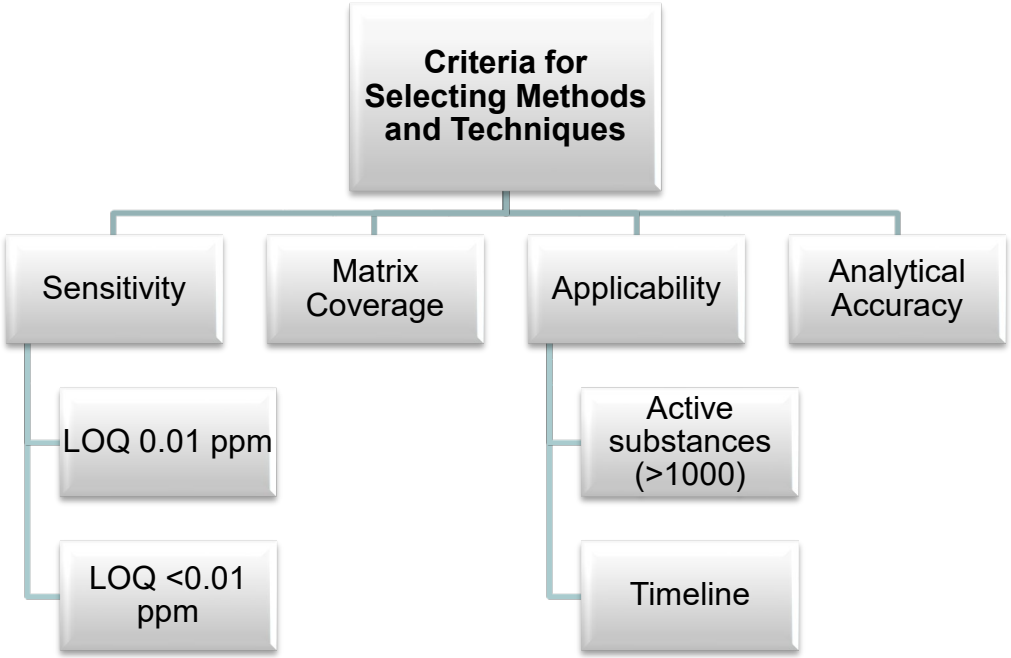
II. Applying International Testing Methods – The Role of Testing in Organic Food Products

Pesticide Residue Analysis Method



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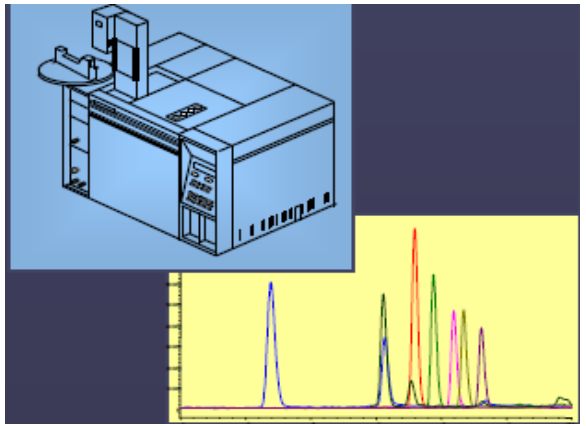
Pesticide Residue Analysis Method

- **Method:** EN 15662:2018 _QuEChERS
- **Tech:** LC-MS/MS, GC-MS/MS
- **Applicability:** Non-polar and low-polarity active substances
- **Scope:** Apply on various matrix samples
  - Fruits/ vegetables high water/high acid and water content
  - High starch and/or protein content and low water and fat content
  - Concentrated high sugar content
  - High oil content and low/intermediate water content
  - Difficult or unique commodities (hops, cocoa bean, coffee, tea, spices)
  - Meat (muscle) and seafood
  - Milk products; eggs; fat from food of animal origin



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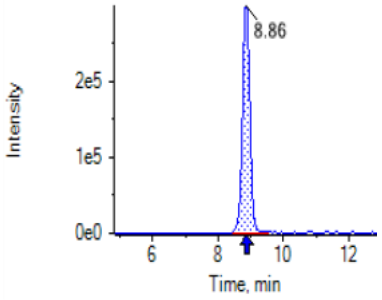
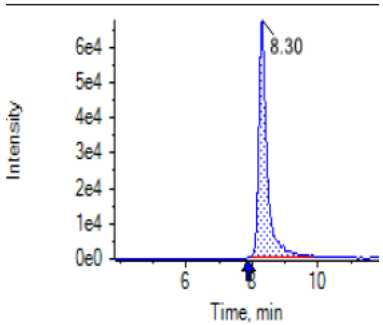
Pesticide Residue Analysis Method

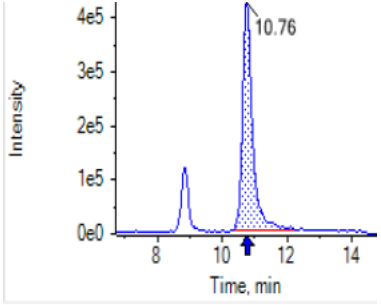
- Method: QuPPe-PO (Quick Polar Pesticides – Plant Origin)
- Tech: **LC-MS/MS hoặc IC-MS/MS**
- **Applicability**: Effective analysis of polar compounds



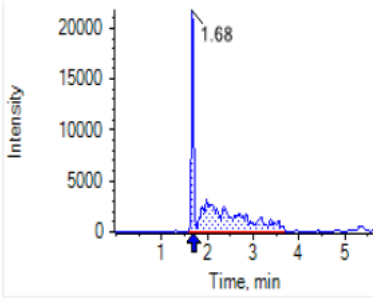
Fosetyl 109/81 T



Glyphosate 168/63T



Phosphonic acid 81/79



AMPA 110/63 T

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Mycotoxin Analysis Method

Aspect	ISO 23719:2025	EN 17641:2022
	Cereals and cereal products – Determination of 17 mycotoxins by ultra-high-performance liquid chromatography and tandem mass spectrometry method (UHPLC-MS/MS)	Foodstuffs-Multimethod for the determination off aflatoxins, deoxynivalenol, fumonisins, ochratoxin A, T-2 toxin, HT-2 toxin and zearalenone by LC-MS/MS
Scope	Cereal grains and cereal-based products (e.g. wheat, maize, husked rice, rice). Not applicable to foods for infants and young children.	Road range of food matrices: cereals, cereal-based foods, infant foods, nuts, dried fruits, milk powder, and spices.
Analytical Principle	Ultra-high-performance liquid chromatography coupled with tandem mass spectrometry (**UHPLC–MS/MS**)	Liquid chromatography coupled with tandem mass spectrometry (**LC–MS/MS**)
Typical Advantages	• Broader analyte coverage including modified toxins • High sensitivity and resolution • Faster analysis time	• Applicable to more food types • Established for official EU control • Widely validated and reproducible
Limitation	• Restricted to cereal matrices • Requires advanced instrumentation and experienced analysts	• Fewer analytes (no modified toxins) • Slightly longer run time compared to UHPLC systems

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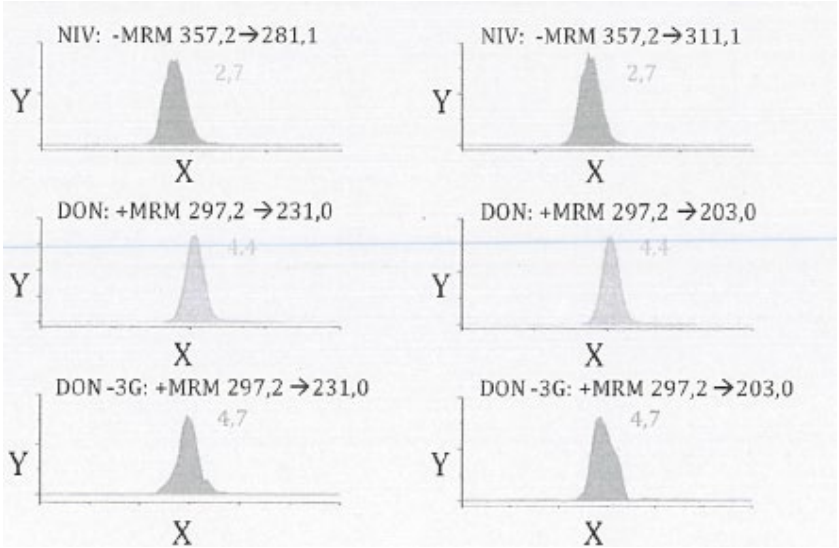
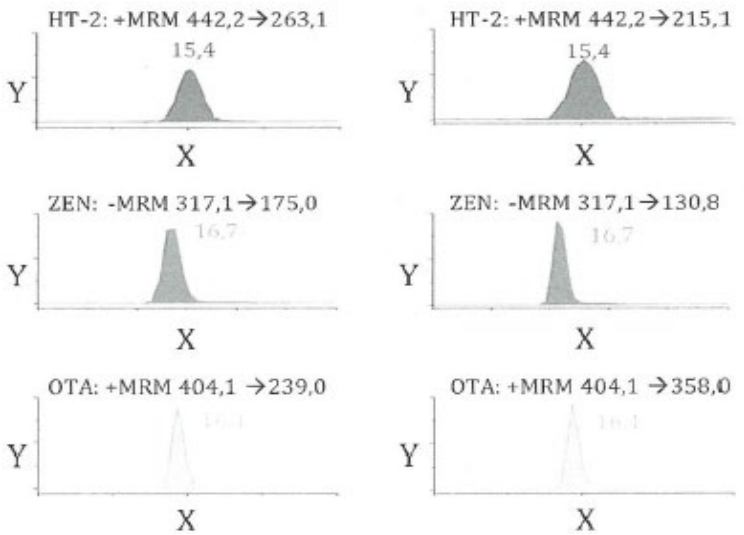
Mycotoxin Analysis Method





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GMO Detection Method

Total number of approved GMO events worldwide (as of April 26, 2025)		387*	Rate
Commonly transferred sequences/genes	35S promoter	243	63%
	FMV promoter	80	21%
	NOS terminator	250	65%
	cry1Ab/Ac	78	20%
	Pat(syn)	123	32%
	nptII	106	27%
	EPSPS/CP4	132	34%
	Agroborder II	150	39%

Multiplex kit	Detection rate
GMOScreen RT 35S/NOS/ABII IPC (LR)	83%
GMOScreen RT 35S/NOS/FMV IPC (LR)	79%

References:
https://www.genbitgroup.com/en/gmo/gmodatabase/
https://www.isaaa.org/

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GMO Detection Method

	Protein-Based Tests	DNA-Based Tests
Advantages	- Simple testing methods - Can be used in the field - Specific to a particular protein	- High sensitivity and specificity - Can detect multiple GM genes in a single test - Can detect DNA in processed or treated samples - Able to detect very low GMO content (below 0.1%) - Can quantify the percentage of GMO in the sample
Disadvantages	- Only effective if the sampled tissue contains the target protein - *E.g., root extract will not yield results if the protein is only produced in leaves* - Requires high protein concentration in the sample - Cannot detect proteins in heated or processed samples - Less accurate quantification compared to real-time PCR	- PCR inhibitors such as fats, tannins, and polysaccharides in the sample may affect results - Not suitable for rapid on-site testing



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Summary of Key Analytical Methods in Food Safety

Category	Standard / Method	Technique	Main Target Analytes	Scope / Matrices	Key Strengths
Pesticides	**EN 15662:2018** (QuEChERS) **QuPPe-PO**	GC–MS/MS & LC–MS/MS	>1000 pesticide residues	Fruits, vegetables, cereals	Broad coverage both non and high polar pesticides
Mycotoxins (EU method)	**EN 17641:2022**	LC–MS/MS	11 regulated mycotoxins (AFs, DON, ZEN, OTA, T-2/HT-2, FBs)	Wide food matrices including infant foods	Harmonized EU multimethod, routine control
Mycotoxins (ISO method)	**ISO 23719:2025**	UHPLC–MS/MS	17 mycotoxins including modified forms	Cereals & cereal-based products	High sensitivity, faster analysis, broader coverage
GMO Detection		Real-time PCR (DNA-based)	GMO-specific DNA sequences	All plant-derived food/feed products	High specificity, regulatory compliance for GMO labeling

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