Case study related to Fraud

Phosphonic acid in Chinese Organic Ginger

Purpose

The supplier audit aimed to investigate recurring phosphonic acid contamination in organic ginger, identify its root causes, and assess the compliance of cultivation and processing methods with the EU Organic Regulation.

Audit Objectives

Source of Contamination

- Examination of recurring phosphonic acid residues and other unauthorized substances in organic ginger.

Root Cause Investigation

- Identification of contamination sources throughout the supply chain until export.

Regulatory Compliance

- Assessment of whether cultivation and processing practices comply with the EU Organic Regulation.

Methodology of the Supplier Audit

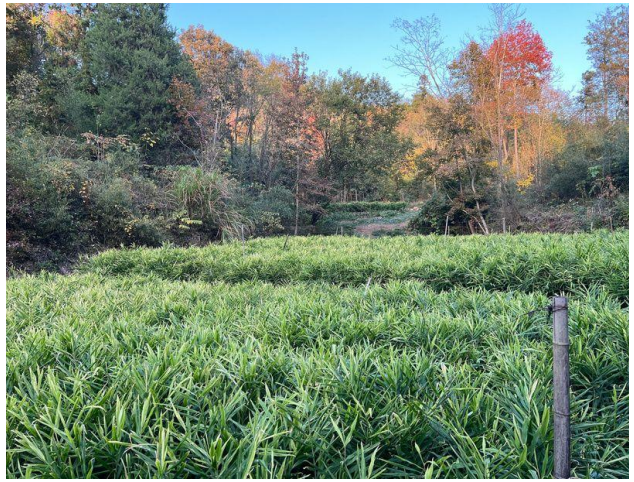
- On-site visits of three farms, three processing facilities, and one fertilizer plant (production of organic manure).
- Analysis of soil, water, leaves, dust, ginger and manure samples.
- Assessment of traceability and the effectiveness of the export company precautionary measures.

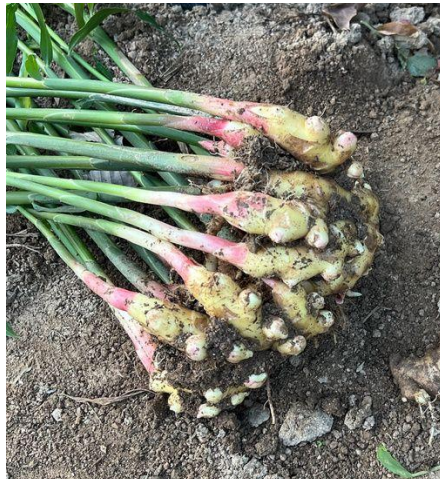



Supplier Audit Results

- Fresh ginger showed minimal residues, but contamination of soil, leaves and storage dust could be identified.
- No direct application of prohibited substances could be identified during the visit, but unauthorized plant protection substances were found in the surroundings of the ginger fields.
- Traceability to the field was not possible and handling of organic and conventional products was partly not compliant.

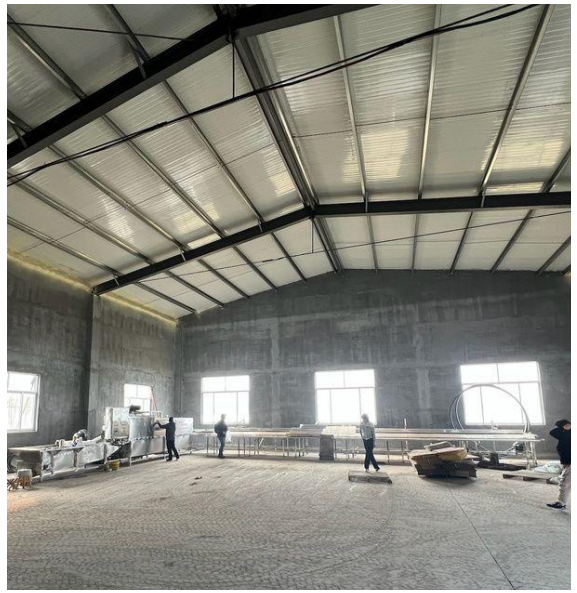
Producer A





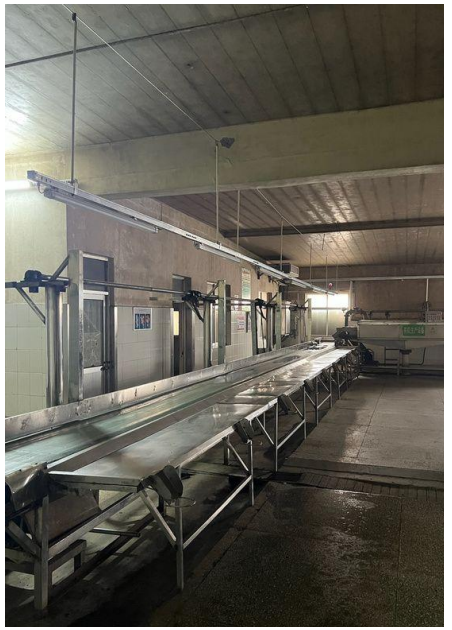
Photos by Henry Sikorski

Producer B



Photos by Henry Sikorski

Producer C



Photos by Henry Sikorski

Analysis Results (Field)

Producer A Samples	Residue	Result (mg/kg)
Organic Ginger	-	-
Organic Ginger, seed	Phosphonic acid	< BG
	Chlorfenapyr	< BG
Leaves (intermediate crop)	Phosphonic acid	< BG
Soil	Phosphonic acid	< BG
Pond water	Phosphonic acid	< BG

Producer B Samples	Residue	Result (mg/kg)
Organic Ginger, harvest	-	-
Organic Ginger, seed	Phosphonic acid	< BG
Leaves	Phosphonic acid	< BG
	Difenoconazole	< BG
	Perchlorate	0.010
Soil	Phosphonic acid	0.146
	Prochloraz (metabolite)	0.011
	Pyraclostrobin	0.010
	Diuron	0.070

Producer C Samples	Residue	Result (mg/kg)
Organic Ginger	Phosphonic acid	-
	Cyhalothrin, Lambda	< BG
Organic Ginger, planting tuber	Phosphonic acid	< BG
Leaves	Phosphonic acid	< BG
	Cypermethrin	0.059
	Difenoconazole	< BG
	Perchlorate	0.020
	Prochloraz	< BG
Soil	Phosphonic acid	0.081
	Cypermethrin	0.040
	Difenoconazol	0.016
	Prochloraz	0.060
	Tebuconazol	0.042
	Trifloxystrobin	0.007

Analysis Results (Facility)

Producer A Samples	Residue	Result (mg/kg)
Organic Ginger, sample A	-	-
Organic Ginger, sample B	-	-
Dust, storage B, floor	Phosphonic acid	0.942
	Bifenthrin	0.065
	Pendimethalin	0.011
	Pyraclostrobin	< BG

Producer B Sample	Residue	Result (mg/kg)
Organic Ginger Sample C	-	-
Organic Ginger Sample D	-	-
Conv. Ginger	Lufenuron	< BG
Operational Water (Intake)	Phosphonic acid	< BG
	Clothianidin	0.030
	Thiamethoxam	0.090
Dust, Organic Storage	Phosphonic acid	1.590
	Anthraquinone	0.513
	Pendimethalin	0.017
	Phtalimid	0.197
	Pyraclostrobin	< BG
Dust, Drying Room	Phosphonic acid	0.171
	Anthraquinone	0.408
	Atrazine	< BG
	Bifenthrin	0.062
	Chlorfenapyr	0.038
	Clothianidin	1.770
	DDE-pp	0.010
	Imidacloprid	0.276
	Permethrin	< BG
	Tebuconazole	< BG
	Thiamethoxam	0.584

Analysis Results (Facility)

Producer C Sample	Residue	Result (mg/kg)
Ginger, Storage A	-	-
Dust, Organic Storage	Phosphonic acid	3.000
	Bifenthrin	0.025
	Carbendazim	0.011
	Chlorfenapyr	0.015
	Clothianidin	0.012
	Cyhalothrin, .Lambda	0,010
	DDT-pp	0,030
	Difenoconazol	< BG
	Imidacloprid	0,038
	Isoprocarb	0,205
	Pendimethalin	0,020
	Permethrin	0,265
	Phtalimid	0,035
	Procymidon	0,015
	Pyridaben	3,260
	Pyraclostrobin	0,017
	Metolachlor	< BG
	Tetramethrin	0,080
	Transfluthrin	0,055
Washing Water, Intake	Phosphonic acid	< BG
Ginger, seedling	Phosphonic acid	-
Soil	Phosphonic acid	-
Cow manure	Phosphonic acid	0,36

Phosphonic Acid: Root Causes

Manure

- Phosphonic acid likely originated from mixing certified organic fertilizer with PA content with organic manure in a fertilizer plant.

Uneven Phosphonic Acid Distribution in harvested Ginger

- Poor homogenization and manual application of manure resulted in inconsistent phosphonic acid distribution in the field and rhizomes.

Source

- Phosphonic acid residues stem from certified organic fertilizer which is mixed with organic fertilizer

The Matrine case in Italy (2014)

- Matrine formulations were sold from China to Italy – labelled as a "plant extract / natural fertiliser" to bypass border controls for plant protection products.
- These imported "plant extracts / natural fertilisers" were sold in Italy (re-packed, labelled in Italian language).
- The imported "raw Matrine formulations" also were used for including them into other fertiliser formulations sold.

Thank you very much for your attention!