

Technical Datasheet

Analysis Name: Pyrrolizidine and Tropane Alkaloids by LC-MS/MS

Method Number: LI-00.013

Scope of Application: Tea, herbal infusions, herbs, seed spices, cereals, milk, honey and botanical supplements (except 5-loxin)

Description: Quantitative analysis for 43 Pyrrolizidine Alkaloids and 2 Tropane Alkaloids

Sample Weight Required: 500 g

Method Reference: AOAC First Action Method 2025.02

Analytical Platform: LC-MS/MS

Special Information: Maximum Levels of PAs, as a sum, in food as set by EU 2020/2040

Commodities	Maximum Levels (µg/kg), as Sum of regulated PAs
Herbal infusions (dried product) <i>except:</i>	200
- <i>Herbal infusions of rooibos, anis, lemon balm, chamomile, thyme, peppermint, lemon verbena and mixtures of this herbs</i>	400
Tea and flavored tea (dried product)	150
Tea, flavored tea and herbal infusions for infants and young children (dried product)	75
Tea, flavored tea and herbal infusions for infants and young children (liquid product)	1.0
Food supplements containing herbal ingredients including extracts	400
Pollen based food supplements Pollen and pollen products	500
Borage leaves (fresh, frozen) placed on the market	750
Dried herbs, <i>except:</i>	400
- <i>Borage, lovage, marjoram, oregano and mixtures exclusively composed of these dried herbs</i>	1000
Cumin seeds (seed spice)	400



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Analyte Reported	Unit of Measure	Limit of Quantification	Reproducibility
Pyrrolizidine alkaloids (Total)	ug/kg	Sum (lower bound)	N/A
Echimidine	ug/kg	1.0	≤20% (≤ 30% milk)
Echimidine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Europine	ug/kg	1.0	≤20% (≤ 30% milk)
Europine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Heliotrine	ug/kg	1.0	≤20% (≤ 30% milk)
Heliotrine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Intermedine	ug/kg	1.0	≤20% (≤ 30% milk)
Intermedine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Lasiocarpine	ug/kg	1.0	≤20% (≤ 30% milk)
Lasiocarpine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Lycopsamine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Retrorsine	ug/kg	1.0	≤20% (≤ 30% milk)
Retrorsine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Seneciphylline	ug/kg	1.0	≤20% (≤ 30% milk)
Seneciphylline-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Senecionine	ug/kg	1.0	≤20% (≤ 30% milk)
Senecionine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Senecivernine	ug/kg	1.0	≤20% (≤ 30% milk)
Senecivernine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Senkirkine	ug/kg	1.0	≤20% (≤ 30% milk)
Lycopsamine/Indicine	ug/kg	1.0	≤20% (≤ 30% milk)
Indicine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Echinatine	ug/kg	1.0	≤20% (≤ 30% milk)
Echinatine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Heliosupine	ug/kg	1.0	≤20% (≤ 30% milk)
Heliosupine-N-Oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Intergerrimine*	ug/kg	1.0	≤20%
Intergerrimine-N-Oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Rinderine	ug/kg	1.0	≤20% (≤ 30% milk)
Rinderine-N-Oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Spartioidine	ug/kg	1.0	≤20% (≤ 30% milk)
Usaramine	ug/kg	1.0	≤20% (≤ 30% milk)
Usaramine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Erucifoline	ug/kg	1.0	≤20% (≤ 30% milk)
Erucifoline-N-oxide**	ug/kg	1.0	≤20% (≤ 30% milk)
Jacobine	ug/kg	1.0	≤20% (≤ 30% milk)
Jacobine-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)



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Jacoline	ug/kg	1.0	≤20% (≤ 30% milk)
Monocrotaline	ug/kg	1.0	≤20% (≤ 30% milk)
Monocrotaline-N-oxide	ug/kg	1.0	≤20% (≤ 30% milk)
Riddelliine	ug/kg	1.0	≤20% (≤ 30% milk)
Trichodesmine	ug/kg	1.0	≤20% (≤ 30% milk)
Atropine	ug/kg	1.0 (0.5 cereals)	≤20% (≤ 30% milk)
Scopolamine	ug/kg	1.0 (0.5 cereals)	≤20% (≤ 30% milk)

**Compound not reported in milk products*

***Compound not reported in honey*