Table S1. Scores obtained for the studied analytical procedures for the determination of phthalates in edible oil samples by employing the AGREE (a) and AGREE prep (b) evaluation tools

Principle	Subject	MAE-GPC-SPE HRGC-MS/MS	MDPE LC-DAD	LLE-dSPE GC-MS	LLE-QuEChERS-dSPE GC-MS	HS-SPME GC-FID	PLS-SERS
AGREE							
1	Direct analytical techniques should be applied	0.48	0.48	0.05	0.48	0.48	0.48
2	Minimal sample size and minimal number of samples are goals	0.75	0.32	0.65	0.65	0.55	0.75
3	If possible, measurements should be performed in situ	0.00	0.00	0.00	0.00	0.00	0.00
4	Integration of analytical processes and operations saves energy and reduces the use of reagents	0.00	1.00	1.00	0.00	0.00	1.00

5	Automated and miniaturized methods should be selected	0.00	0.00	0.75	0.50	0.75	0.75
6	Derivatization should be avoided	1.00	1.00	1.00	1.00	1.00	1.00
7	Generation of a large volume of analytical waste should be avoided, proper management of waste should be provided	0.09	0.08	0.60	0.42	0.36	0.60
8	Multi-analyte or multi-parameter methods are preferred versus methods using one analyte at a time	0.84	0.42	0.62	0.29	0.74	0.94
9	The use of energy should be minimized	0.50	0.50	0.00	0.00	0.00	1.00

10	Reagents obtained from renewable sources should be preferred	0.00	0.00	0.50	0.00	0.50	0.00
11	Toxic reagents should be eliminated or replaced	0.00	0.00	1.00	1.00	1.00	1.00
12	Operator's safety should be increased	0.80	0.80	0.80	0.80	1.00	1.00
AGREE prep							
1	Sample preparation placement	0.00	0.00	0.00	0.00	0.00	0.33
2	Hazardous materials	0.00	0.63	0.00	0.07	0.00	0.13
3	Sustainability, renewability, and reusability	0.00	0.25	0.25	0.75	0.50	0.75
4	Waste	0.00	0.00	0.52	0.32	0.23	0.63
5	Size economy of the sample	0.77	0.67	0.67	0.67	0.57	0.77
6	Sample throughput	0.54	0.71	0.54	0.76	0.87	0.96
7	Integration and automation	0.00	0.12	0.50	0.25	0.00	0.50

8	Energy consumption	0.00	0.59	0.41	0.41	0.41	1.00
9	Configuration for analysis	0.25	0.25	0.25	0.25	0.25	0.75
10	Operator's safety	0.50	0.50	0.50	0.75	0.75	0.00

MAE-GPC-SPE: microwave-assisted extraction gel permeation chromatography solid phase extraction; HRGC-MS: high-resolution gas chromatography-mass detection; LC-DAD: liquid chromatography diode-array detector; LLE-dSPE: liquid-liquid extraction dispersive solid phase extraction; GC-MS: gas chromatography-mass detection; HS-SPME: headspace solid phase microextraction gas chromatography; GC-FID: gas chromatography flame ionization detection; PLS-SERS: partial least squares- Surface-enhanced Raman spectroscopy; LLE-QuEChERS-dSPE: Liquid-liquid extraction-Quick, Easy, Cheap, Effective, Rugged and Safe extraction gas chromatography flame ionization detection; Colors in the table: colorimetric classification of AGREE tool, from deep green (sustainable) to dark red (non sustainable)

Table S2. Options assigned for the studied analytical procedures for the determination of phthalates in edible oil samples by employing the BAGI evaluation tool

Principle	**Subject**	**MAE-GPC-SPE HRGC-MS/MS**	**MDPE LC-DAD**	**LLE-dSPE GC-MS**	**LLE-QuEChERS-dSPE GC-MS**	**HS-SPME GC-FID**	**PLS-SERS**
BAGI							
1	Type of analysis	Quantitative	Quantitative	Quantitative	Quantitative	Quantitative/Confirmatory	Quantitative

2	Multi or single analysis	> 15 compounds	6–15 compounds	Single	> 15 compounds	2–5	2–5
3	Analytical Technique	Not commonly	Simple common	Sophisticated	Sophisticated	Simple common	Not commonly
4	Simultaneous sample preparation	2–12	2–12	2–12	13–95	13–95	13–95
5	Sample preparation	Multi step	Multi step	Multi step	Miniaturized extraction	Miniaturized extraction	Simple
6	Samples per h	2–4	≤ 1	2–4	≤ 1	2–4	> 10
7	Reagents and materials	Common	Synthetized	Common	Available not common	Synthetized	Synthetized
8	Preconcentration	Required. Legislation	Required. Sensitivity	Required. Legislation	Required. Legislation	Required. Sensitivity	No preconcentration
9	Degree of automation	Manual	Semi-automated	Semi-automated	Semi-automated	Semi-automated	Semi-automated
10	Amount of sample	< 10 mL	< 10 mL	< 10 mL	> 100 mL	< 10 mL	< 10 mL

MAE-GPC-SPE: microwave-assisted extraction gel permeation chromatography solid phase extraction; HRGC-MS: high-resolution gas chromatography-mass detection; LC-DAD: liquid chromatography diode-array detector; LLE-dSPE: liquid-liquid extraction dispersive solid phase extraction; GC-MS: gas chromatography-mass detection; HS-SPME: headspace solid phase microextraction gas chromatography; GC-FID: gas chromatography flame ionization detection; PLS-SERS: partial least squares- Surface-enhanced Raman spectroscopy; LLE-QuEChERS-dSPE: Liquid-liquid extraction-Quick, Easy, Cheap, Effective, Rugged and Safe extraction gas chromatography flame ionization detection