GL Sciences

Sample preparation for pesticides in fruits and vegetables

QuEChERS

EN 15662 Method

AOAC 2007.01 Method

GL Sciences - QuEChERS kit

QuEChERS (pronounced Catchers) is a sample preparation technique.

QuEChERS is an acronym for *Quick, Easy, Cheap, Effective, Rugged* and *Safe* which exactly explains its purpose. The kit makes the process of detecting pesticides in food samples easier and faster. It has become a common knowledge that pesticides influence the health of people. Different regulations all over the world make it important for the food industry to detect the different pesticides used on their import products. Therefore the QuEChERS kit was developed in 2003 and have become more important ever since.

There are 2 different methods written by both a European autority and an American autority referred to as the EN 15662 Method (EU) and the AOAC 2007.01 Method (USA).

How do they work?

The functionality of the QuEChERS kit is to extract any interfering matrices from the sample. The first step (explained on the next page) transfers the pesticides from the water to the added acetonitrile phase by applying $MgSO_4$.

Lipids, sugars and pigments are the most important interfering matrices. The second step gets rid of these. Again $MgSO_4$ is added to separate any water. $P_{rimary}S_{econdary}A_{mine}$ removes fatty acids and sugars, $G_{raphite}C_{arbon}B_{lack}$ removes pigments and sterols. C18 makes sure that the pesticides do not dissolve in the lipid layer that arises in fat fruits and vegetables (sample > 1% fat).

The extraction can be done after homogenizing 10 grams of the sample. When working with dried fruits, add some water before homogenizing. Apply the sample to the provided 50 mL test tubes for the first step. Starting the second step can be done by applying the aliquot supernatant to the provided 2 mL or 15 mL centrifuge tubes.

What QuEChERS kit to use?

On the next page one can find the Buffered Extraction Kits. Pay attention to choosing the correct one for the international market you're producing for (either EU or USA).

On the back of this folder a list of QuEChERS kits can be found with a description on what fruits and vegetables they should be used with. Again observe the EU and USA method being displayed.

Using the wrong QuEChERS kit can lead to a contaminated chromatogram as well as a contaminated column. Make sure you do know what matrices inside the fruits you are dealing with.

Method, Step 1

Sample → Homogenize → **10/15 g Sample** → Add Acetonitrile → Shake by hand for 1 min. → Add Extraction kit and internal standard → Shake by hand for 1 min. → Centrifuge for 5 min. at 4,000 rpm → **Extract Supernatant**

GL Sciences B.V. Bufferd Extraction Kit	
EN 15562 Method Buffered Extraction Kit 4 g $MgSO_4$, 1 g NaCl, 1 g NaCitrate, 0.5 g diSodium Citrate Sesquihydrate P/No: 8010-1001	AOAC 2007.01 Method Buffered Extraction Kit 6 g $MgSO_4$, 1.5 g NaCitrate P/No: 8010-1002

Method, Step 2

Aliquot Supernatant → Add SPE Kit → Shake by hand for 1 min. → Centrifuge for 5 min. at 4,000 rpm → **Aliquot Supernatant** → GC-MS / LC-MS → **Analyses Report**

GI Sciences B.V. can supply you with the best columns for both GC-MS and LC-MS.

InertCap® GC Columns	InertSustain® LC Columns	Inertsil® LC Columns

Order Information

	Matter Removed from sample	Examples	EN 15562 Method	AOAC 2007.01 METHOD
	General Purpose - Polar Organic Acids - Some Sugars - Some Lipids	•Apple •Peach •Brocolli •Fresh Peas	25 mg PSA, 150 mg $MgSO_4$ 2 ml - 100/box ***P/No: 8010-1003***	50 mg PSA, 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1005***
			150 mg PSA, 900 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1004***	400 mg PSA, 1200 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1006***
	Fruits and vegetables with fats and waxes - Polar Organic Acids - Some Sugars - Lipids - Sterols	•Oranges •Lemons •Animal Sourced •Cereals	25 mg PSA, 25 mg C18 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1007***	50 mg PSA, 50 mg C18 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1009***
			150 mg PSA, 150 mg C18 900 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1008***	400 mg PSA, 400 mg C18 1200 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1010***
	Pigmented fruits and vegetables* - Polar Organic Acids - Some Sugars - Some Lipids - Carotinoides and Chlorophyll	•Zucchini •Strawberry •Dried Peas •Tomatoes	25 mg PSA, 2.5 mg GCB 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1011***	50 mg PSA, 50 mg GCB 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1013***
			150 mg PSA, 15 mg GCB 900 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1012***	400 mg PSA, 400 mg GCB 1200 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1014***
	Highly pigmented fruits and vegetables* - Polar Organic Acids - Some Sugars - Some Lipids - Carotinoides and Chlorophyll	•Black Berries •Spinach •Red Peppers	25 mg PSA, 7.5 mg GCB 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1015***	
			150 mg PSA, 45 mg GCB 900 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1016***	
	Fruits and vegetables with pigments and fats* - Polar Organic Acids - Some Sugars - Some Lipids - Carotinoides and Chlorophyll	•Dairy products •Curry Spices •Baby food		50 mg PSA, 50 mg C18 50 mg GCB, 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1017***
				400 mg PSA, 400 mg C18 400 mg GCB, 1200 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1018***
	Other food methods - Fats - Lipids - Proteins	•Olive Oil •Citrus Oil •Liver		25 mg C18 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1019***
				150 mg C18 900 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1020***
	All food types - All matrix interfering materials			50 mg PSA, 50 mg C18 7.5 mg GCB, 150 mg $MgSO_4$ 2mL - 100/box ***P/No: 8010-1021***
				400 mg PSA, 400 mg C18 45 mg GCB, 1200 mg $MgSO_4$ 15mL - 50/box ***P/No: 8010-1022***

** Not for use with planar pesticides*

Contact

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