



Streamlined Method for Pesticide Residues in High-Lipid Food Samples using QuEChERS Extraction, LipiFiltr[®] Cleanup and UHPLC-MS/MS Analysis

LipiFiltr[®]

UCT Part Numbers

LPFLTR01

LipiFiltr[®] push-through cartridge

ECQUEU7-MP

Mylar pouch containing 4g
MgSO₄, 1g NaCl, 1g Na₃Cit•2H₂O
and
0.5g Na₂Cit•1.5H₂O

SLAQ100ID21-18UM

Selectra[®] Aqueous C18
UHPLC column
(100 × 2.1 mm, 1.8 μm)

SLAQGDC20-18UM

Selectra[®] Aqueous C18
guard cartridge
(10 × 2.1 mm, 1.8 μm)

SLGRDHLDLDR-HP

High pressure guard cartridge
holder



Summary:

Complex samples that are high in lipid content pose one of the greatest challenges in pesticide residue analysis. Typical sample preparation procedures, such as QuEChERS, are easy to carry out and well-suited for the extraction of a wide range of pesticide residues. However, they also extract a large amount of matrix components, including lipids, which can lead to poor analyte recovery, reproducibility, chromatographic interference, ion suppression/enhancement, and additional instrument maintenance. Current sample cleanup options may not be suitable for effectively and selectively removing these unwanted interferences. Large amounts of lipids remaining in the sample may then necessitate the use of additional cleanup steps or the use of a product that will indiscriminately retain lipids and analytes of interest. To overcome these challenges UCT recently introduced a new product for the cleanup of fatty samples – LipiFiltr[®].

This application note outlines the performance benefits achieved using the new LipiFiltr[®] cartridge in applications involving multi-class, multi-residue analysis for a wide range of pesticides (n=189) in complex, high fat samples. The easy-to-use LipiFiltr[®] push-through purification cartridge was designed to remove lipids from acetonitrile extracts. Samples are extracted using a standard QuEChERS procedure and an aliquot of the supernatant is simply pushed through the LipiFiltr[®] purification cartridge using a disposable syringe. The purified extract is collected in an autosampler vial and analyzed by UHPLC-MS/MS. The ability to obtain significantly cleaner extracts, ease of use, and time and cost savings make the new LipiFiltr[®] push-through cartridges an attractive cleanup option for laboratories conducting pesticide residue analysis in complex fatty samples.



FOOD

QuEChERS Procedure:

Sample Extraction

For high water content (>70%) samples:

Weigh 10g of homogenized sample into a 50 mL centrifuge tube.

- For this study ground beef (80% lean), salmon, avocado, swordfish and whole black olives were evaluated.

For low water content samples:

Weigh 3g of homogenized sample into a 50 mL centrifuge tube and add 7 mL of reagent water.

- For this study olive oil, chicken fat and whole macadamia nuts were evaluated.

1. Add fortification standards and/or internal standards.
2. Add 10 mL acetonitrile.
3. Shake on a SPEX® SamplePrep® GenoGrinder® (or alternative mechanical shaker) or vortex samples for 5 minutes at 1500 strokes/minute.
4. Add **ECQUEU7-MP** packet to each sample and shake for 1 additional minute at 1500 strokes/minute.
5. Centrifuge the samples for 15 min at ≥ 3000 rcf.

Sample Cleanup

1. Attach the LipiFiltr® push-through cartridge to disposable syringe.
2. Transfer 1.5 mL of supernatant into the syringe barrel. Attach the plunger and gently push the sample through the LipiFiltr® cartridge into an autosampler vial for analysis.

LC-MS/MS Parameters:

Table 1. HPLC Conditions	
UHPLC system	Shimadzu Nexera X2
MS/MS system	Shimadzu LCMS-8050
UHPLC column	Selectra® Aqueous C18 HPLC Column 100 x 2.1 mm, 1.8 μ m
Guard column	Selectra® Aqueous C18 HPLC Guard Column 10 x 2.0 mm, 1.8 μ m
Column temp.	50°C
Injection volume	2 μ L
Flow rate	450 μ L/min
Mobile Phase A	H ₂ O containing 0.1% formic acid + 5mM ammonium formate
Mobile Phase B	MeOH containing 0.1% formic acid + 5mM ammonium formate

Table 2. UHPLC Gradient		
Time (min)	A (%)	B (%)
0.0	100	0
0.5	70	30
2.0	50	50
4.0	35	65
10.0	15	85
13.0	0	100
15.0	0	100
15.1	100	0
18.0	100	0

Table 3. MRM Transitions

Compound		R ²	Precursor Ion	Product Ion 1	Product Ion 2
1	3-hydroxycarbofuran	0.9987	238.1	181.0	163.0
2	Acephate	0.9990	184.0	143.0	49.0
3	Acetamiprid	0.9991	223.0	126.0	56.1
4	Aldicarb	0.9833	208.4	91.1	65.1
5	Aldicarb Sulfoxide	0.9994	207.1	132.1	132.1
6	Aldoxycarb	0.9998	240.2	148.0	76.0
7	Ametryn	0.9994	228.2	186.1	68.0
8	Aminocarb	0.9997	209.1	137.1	152.1
9	Amitraz	0.9971	294.2	122.2	1631.0
10	Azoxystrobin	0.9983	404.2	329.0	344.0
11	Benalaxyl	0.9993	326.2	148.0	208.1
12	Bendiocarb	0.9995	224.1	109.0	109.0
13	Bifenazate	0.9996	301.1	198.0	170.1
14	Boscalid	0.9986	343.0	306.8	140.0
15	Bromuconazole Isomer 1	0.9990	376.0	159.0	-
16	Bromuconazole Isomer 2	0.9986	376.0	159.0	-
17	Bupirimate	0.9994	317.2	166.0	237.1
18	Buprofezin	0.9993	306.0	201.1	57.1
19	Butafenacil	0.9996	492.1	330.9	179.9
20	Butoxycarboxim	0.9990	223.1	166.0	151.0
21	Carbaryl	0.9985	202.1	145.0	127.0
22	Carbendazim	0.9999	192.0	160.0	131.9
23	Carbetamide	0.9998	237.1	192.0	118.1
24	Carbofuran	0.9986	222.2	123.1	123.1
25	Carboxin	1.0000	236.1	143.0	87.1
26	Carfentrazone-ethyl	0.9997	429.1	412.1	346.1
27	Chloantraniliprole	0.9996	484.0	452.8	285.8
28	Chlorfluazuron	0.9988	539.9	382.9	158.1
29	Chlorotoluron	0.9993	213.0	72.1	46.1
30	Chloroxuron	0.9998	291.1	72.1	46.1
31	Clethodim	0.9997	360.1	164.1	268.1
32	Clofentazine	0.9992	303.0	138.0	102.0
33	Clothianidin	0.9999	250.0	169.0	113.0
34	Cyazofamid	0.9994	325.1	108.0	44.0
35	Cycluron	0.9995	199.1	89.1	46.0
36	Cyproconazole Isomer 1	0.9998	292.2	70.1	125.0
37	Cyproconazole Isomer 2	0.9998	292.2	70.1	125.0
38	Cyprodinil	0.9989	225.8	142.1	184.1
39	Cyromazine	0.9917	167.1	68.1	43.1
40	Desmedipham	0.9985	318.2	182.1	136.1
41	Diclobutrazol	0.9932	328.1	70.1	-
42	Diclotophos	0.9992	238.1	112.1	72.0
43	Diethofencarb	0.9999	268.1	226.1	124.0
44	Difenoconazole	0.9992	406.1	251.1	152.0
45	Diflubenzuron	1.0000	311.0	158.0	141.0
46	Dimethoate	0.9997	230.0	199.0	125.0
47	Dimethomorph	0.9993	388.2	300.9	165.1
48	Dimoxystrobin	0.9998	327.1	205.1	116.1
49	Diniconazole	0.9991	326.1	70.0	158.9
50	Dinotefuran	1.0000	203.1	129.1	87.1
51	Dioxacarb	0.9997	224.1	167.1	123.0
52	Diuron	0.9997	233.1	72.1	46.0
53	Emamectin B1a	0.9932	886.5	158.0	82.1
54	Epoxiconazole	1.0000	330.0	121.1	101.0
55	Eprinomectin	0.9971	914.6	186.1	154.1
56	Etaconazole	0.9993	328.2	159.0	55.1
57	Ethiofencarb	1.0000	226.0	107.0	164.0
58	Ethiprole	0.9970	397.0	350.9	255.0
59	Ethirimol	0.9975	210.0	140.1	98.0
60	Ethofumesate	0.9986	309.2	147.2	117.1
61	Etoxazole	0.9986	360.2	141.0	57.1
62	Fenamidone	0.9998	312.0	92.1	236.1
63	Fenarimol	0.9996	331.0	267.9	189.1
64	Fenazaquin	0.9994	307.1	161.0	131.1
65	Fenbuconazole	0.9987	337.0	125.0	70.1



Table 3. MRM Transitions Continued

Compound	R ²	Precursor Ion	Product Ion 1	Product Ion 2	
66	Fenhexamid	0.9977	302.1	97.1	55.1
67	Fenobucarb	0.9996	208.0	95.1	152.1
68	Fenoxycarb	0.9993	302.2	88.1	116.1
69	Fenpropimorph	0.9976	303.9	147.2	117.1
70	Fenpyroximate	0.9996	422.1	366.1	214.0
71	Fenuron	0.9969	165.0	72.1	46.1
72	Fipronil	0.9992	436.9	332.0	252.0
73	Flonicamid	0.9980	230.1	203.0	148.0
74	Fluazinam	0.9998	463.0	415.9	397.9
75	Flubendiamide	0.9948	681.1	254.1	274.1
76	Fludioxonil	0.9859	247.1	180.1	126.1
77	Flufenacet	0.9991	364.1	152.0	194.1
78	Flufenoxuron	0.9993	489.0	158.2	141.0
79	Fluometuron Isomer 1	0.9996	233.1	72.1	46.1
80	Fluometuron Isomer 2	0.9999	233.1	72.1	46.1
81	Fluoxastrobin	1.0000	459.2	427.0	188.1
82	Fluquinconazole	0.9981	376.0	348.9	307.0
83	Flusilazole	0.9997	316.1	247.1	165.1
84	Flutolanil	0.9994	324.1	262.0	242.0
85	Flutriafol	0.9994	302.0	70.1	123.0
86	Forchlorfenuron	0.9993	247.9	129.0	93.1
87	Formetanate	0.9949	222.1	165.0	46.1
88	Fuberidazole	0.9979	185.0	157.1	103.0
89	Furalaxyl	0.9993	302.1	242.1	95.0
90	Furathiocarb	1.0000	383.1	195.0	252.1
91	Halofenozide	0.9955	331.2	238.0	93.0
92	Hexaconazole	0.9996	314.1	70.0	158.8
93	Hexaflumuron	0.9918	459.0	439.0	175.0
94	Hexythiazox	0.9996	353.2	228.0	168.1
95	Hydramethylnon	0.9990	494.8	323.1	151.1
96	Imazalil	0.9991	297.1	159.0	41.1
97	Imidacloprid	0.9999	256.1	175.0	209.0
98	Indoxacarb	0.9994	528.1	149.9	203.0
99	Iproconazole	0.9995	334.2	70.0	124.9
100	Iprovalicarb	0.9995	321.2	119.0	203.1
101	Isocarbophos	0.9994	290.1	146.1	58.0
102	Isoprocarb	0.9931	194.1	95.0	137.0
103	Isoproturon	0.9998	207.1	72.1	46.1
104	Ivermectin	0.9972	897.7	753.6	329.2
105	Kresoxym-methyl	0.9971	314.0	267.1	116.0
106	Linuron	0.9994	249.0	160.0	182.0
107	Lufenuron	0.9996	528.2	203.1	293.0
108	Mandipropamid	0.9991	412.1	328.1	125.0
109	Mefenacet	0.9998	299.1	148.1	120.1
110	Mepanipyrim	0.9996	224.1	106.1	77.1
111	Mepronil	0.9977	270.1	119.0	228.1
112	Metaflumizone	0.9958	505.1	302.1	328.0
113	Metalaxyl	0.9995	280.1	220.1	192.1
114	Metconazole	1.0000	320.1	70.1	125.0
115	Methabenzthiazuron	0.9993	222.1	165.1	150.0
116	Methamidophos	0.9986	142.0	94.0	125.1
117	Methiocarb	0.9998	226.1	169.1	121.1
118	Methomyl	0.9998	163.1	88.0	106.1
119	Methoprotryne	0.9994	272.1	170.0	198.1
120	Methoxyfenozide	0.9993	369.2	313.1	149.0
121	Metobromuron	0.9986	259.0	170.0	148.1
122	Metribuzin	0.9997	215.1	187.1	131.0
123	Mevinphos	0.9992	241.9	127.0	193.0
124	Mexacarbate	0.9997	223.2	166.1	151.1
125	Monocrotophos	0.9984	224.1	127.0	193.1
126	Monolinuron	0.9977	215.1	126.0	148.0
127	Moxidectin	0.9980	640.3	622.2	148.1
128	Myclobutanil	0.9994	289.2	70.1	125.1
129	Neburon	0.9991	275.0	57.1	88.1
130	Nitenpyram	0.9982	271.0	225.0	56.0



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Table 3. MRM Transitions Continued

	Compound	R ²	Precursor Ion	Product Ion 1	Product Ion 2
131	Novaluron	0.9944	491.0	471.0	304.9
132	Omethoate	0.9991	214.0	125.0	183.0
133	Oxadixyl	0.9991	279.1	219.1	132.1
134	Oxamyl	0.9987	237.1	72.0	90.0
135	Paclobutrazol	0.9995	294.0	70.1	125.0
136	Penconazole	0.9990	284.1	70.1	159.0
137	Pencycuron	0.9979	329.2	125.0	218.0
138	Phenmedipham	0.9992	301.2	168.1	136.0
139	Picoxystrobin	0.9992	368.0	145.0	205.0
140	Piperonyl Butoxide	0.9992	356.2	177.0	119.0
141	Pirimicarb	0.9996	239.2	72.0	182.1
142	Prochloraz	1.0000	376.0	308.0	70.1
143	Promecarb	0.9998	208.1	109.0	151.0
144	Prometon	0.9996	226.1	142.1	184.0
145	Prometryne	0.9986	241.8	158.0	200.0
146	Propamocarb	0.9917	189.1	102.0	144.1
147	Propargite	0.9993	368.1	231.1	175.0
148	Propiconazole	0.9995	342.0	159.0	69.0
149	Propoxur	0.9985	210.1	111.0	168.1
150	Pymetrozine	0.9867	218.1	105.0	78.0
151	Pyracarbolid	0.9998	218.1	125.1	97.0
152	Pyraclostrobin	0.9985	388.0	194.0	163.1
153	Pyridaben	0.9994	365.2	147.0	309.1
154	Pyrimethanil	0.9991	199.9	107.2	82.1
155	Pyriproxyfen	0.9996	322.0	96.0	227.1
156	Quinoxifen	0.9993	308.1	197.0	162.0
157	Rotenone	0.9998	395.1	213.1	192.1
158	Secbumeton	0.9991	225.7	142.0	184.1
159	Siduron	0.9988	233.3	94.0	137.1
160	Simetryn	0.9990	214.1	124.1	96.0
161	Spinetoram	0.9941	748.5	142.1	98.2
162	Spinosad A	0.9933	732.5	142.1	98.1
163	Spirodiclofen	0.9977	411.1	71.1	313.0
164	Spiromesifen	0.9986	371.3	273.2	255.2
165	Spirotetramat	0.9999	374.1	330.1	302.0
166	Spiroxamine	0.9993	298.2	144.2	100.1
167	Tebuconazole	0.9998	308.0	70.1	124.9
168	Tebufenozide	0.9997	353.2	133.1	105.0
169	Tebufenpyrad	0.9989	334.0	145.0	117.0
170	Tebuthiuron	1.0000	229.1	172.1	116.0
171	Teflubenzuron	0.9970	379.0	338.9	195.9
172	Temephos	0.9984	467.1	125.0	418.9
173	Terbumeton	0.9916	225.8	142.1	184.1
174	Terbutryn	0.9993	241.8	186.1	-
175	Tetraconazole	0.9983	372.0	159.0	70.0
176	Thiabendazole	0.9986	202.1	175.0	131.1
177	Thiacloprid	0.9998	253.0	126.0	99.0
178	Thiamethoxam	0.9998	292.1	211.1	181.1
179	Thidiazuron	0.9999	221.1	102.1	127.9
180	Thiobencarb	0.9991	258.0	125.0	89.1
181	Thiofanox	0.9997	236.1	143.2	86.9
182	Thiophanate-methyl	0.9999	343.0	151.0	311.1
183	Triadimefon	0.9995	294.0	197.0	69.0
184	Triadimenol	0.9973	296.1	70.0	227.1
185	Trichlorfon	0.9996	257.0	108.9	220.8
186	Tricyclazole	0.9995	190.0	163.0	136.0
187	Trifloxystrobin	0.9991	409.0	186.0	206.0
188	Triflumizole	0.9998	346.1	278.0	73.1
189	Triflumuron	0.9979	359.1	156.0	111.0
190	Triticonazole	0.9993	318.0	70.0	125.0
191	Vamidothion	0.9994	288.0	146.0	118.0
192	Zoxamide	0.9991	336.1	187.0	159.0



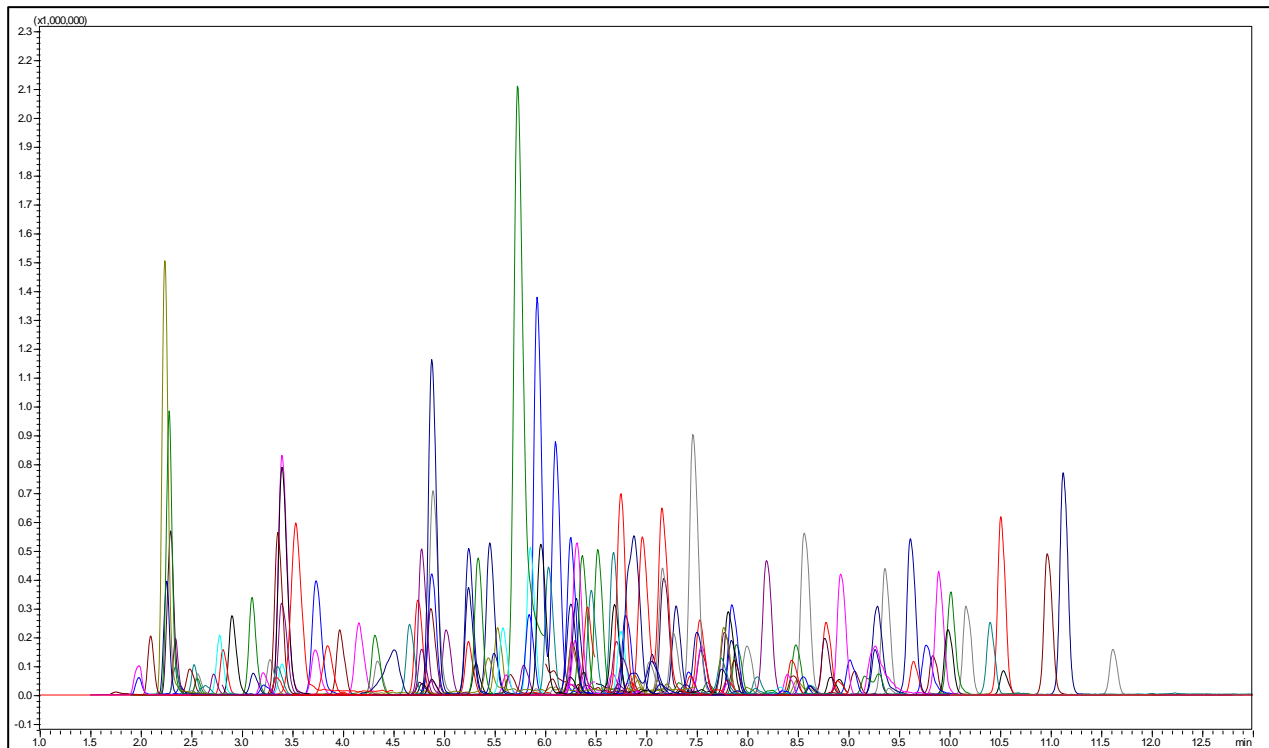


Figure 1. Overlaid chromatogram of all 189 pesticides at 10 ng/mL.

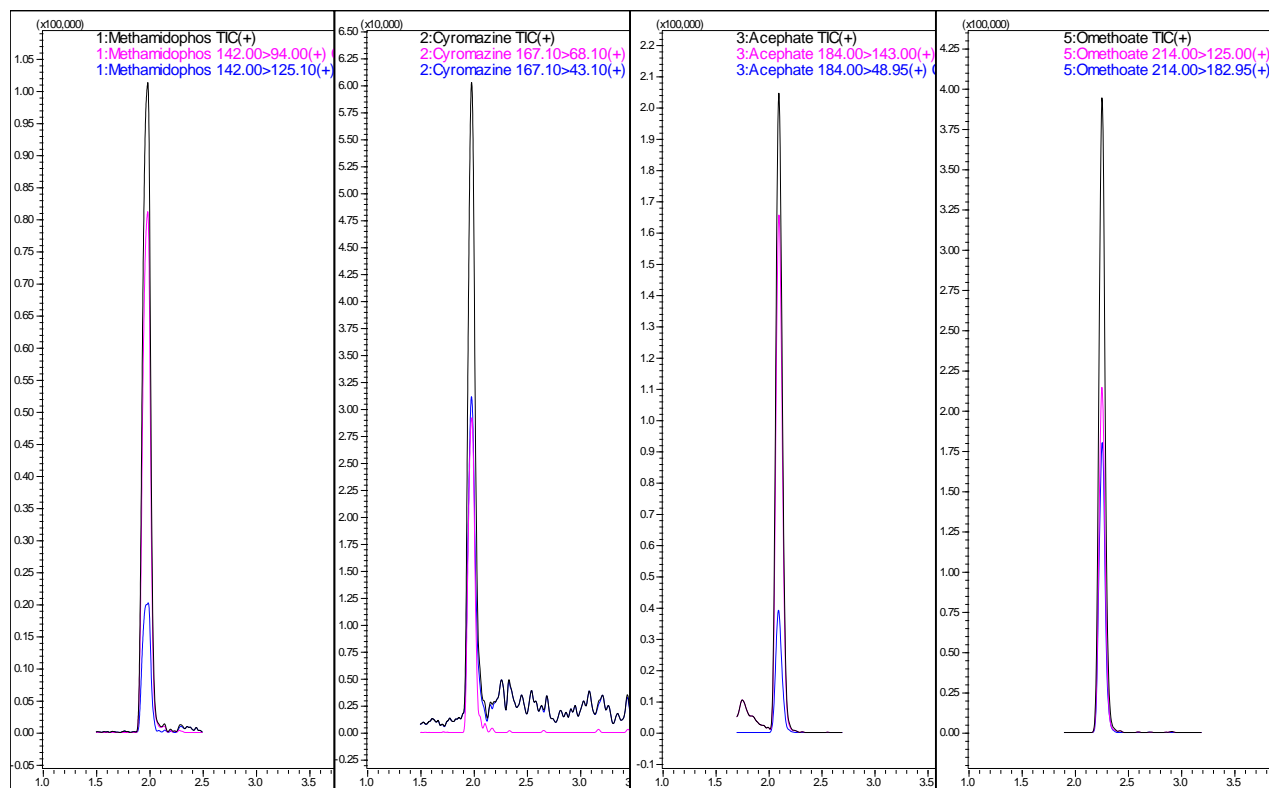
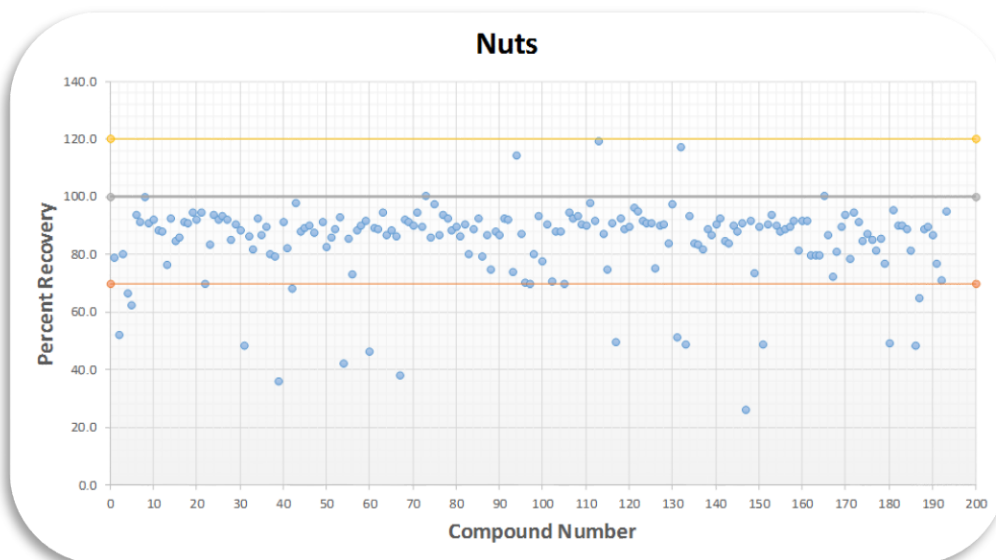
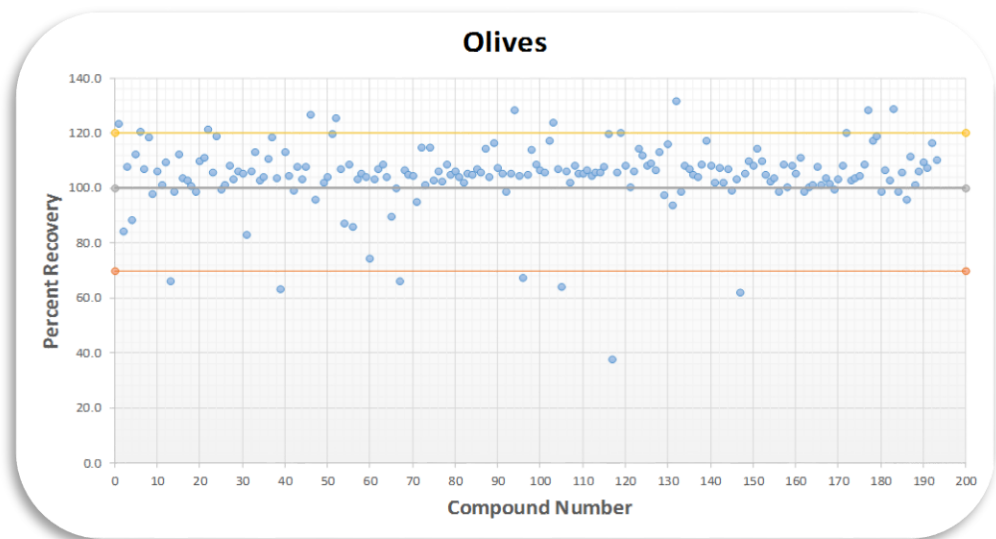
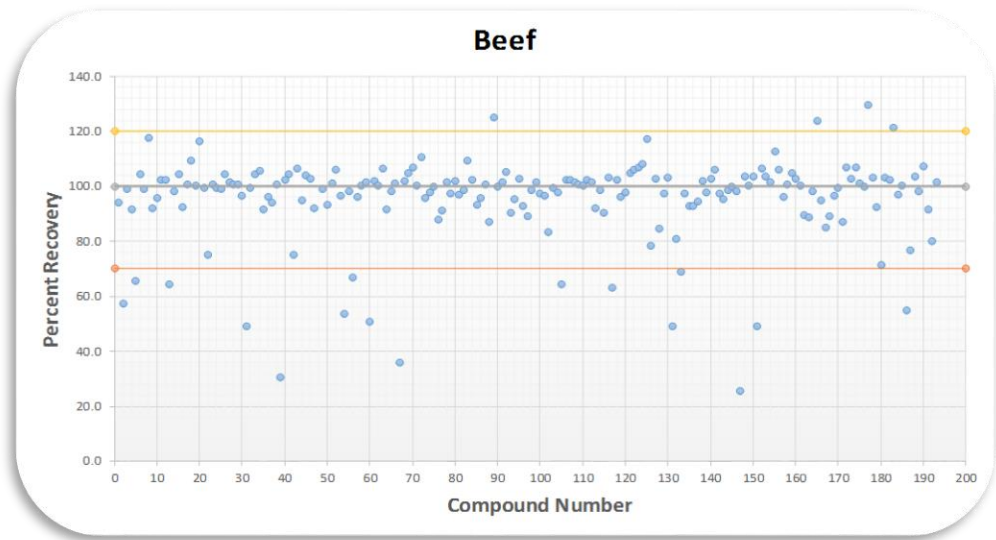


Figure 2. Close-up of polar pesticides (methamidophos, cyromazine, acephate and omethoate) highlighting the excellent retention and peak shapes obtained using the Selectra® Aqueous C18 UHPLC column.

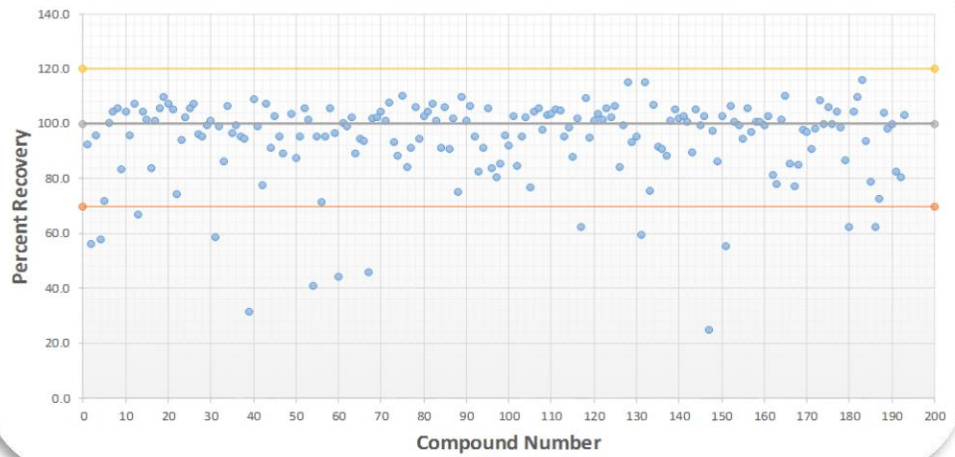
Results:

Summary Charts Showing the Recoveries Obtained for 189 Pesticides in Various High-Lipid Samples
Samples were fortified at 10ng/mL (n=3). Full recovery data per matrix for all compounds evaluated
can be found in supplementary addendums.

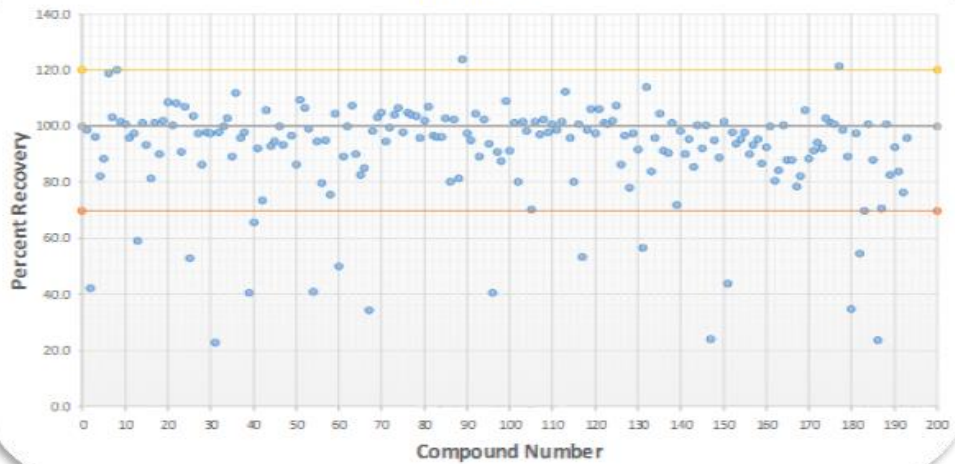




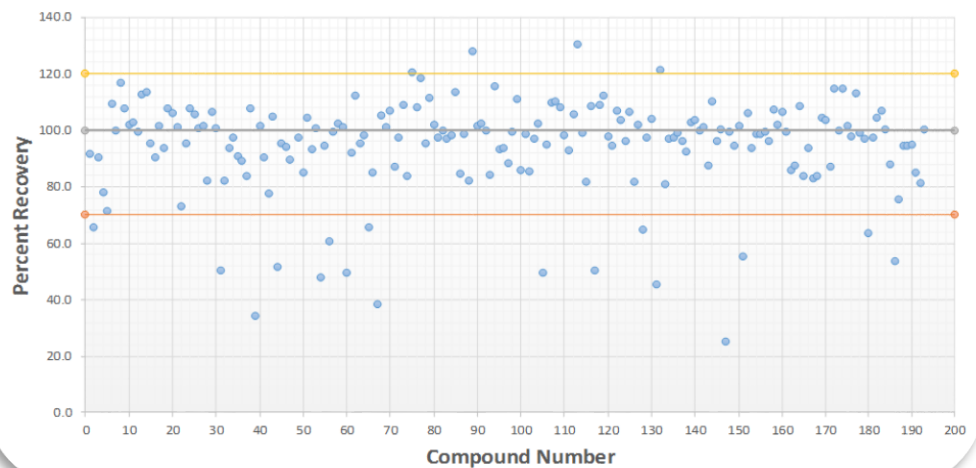
Salmon



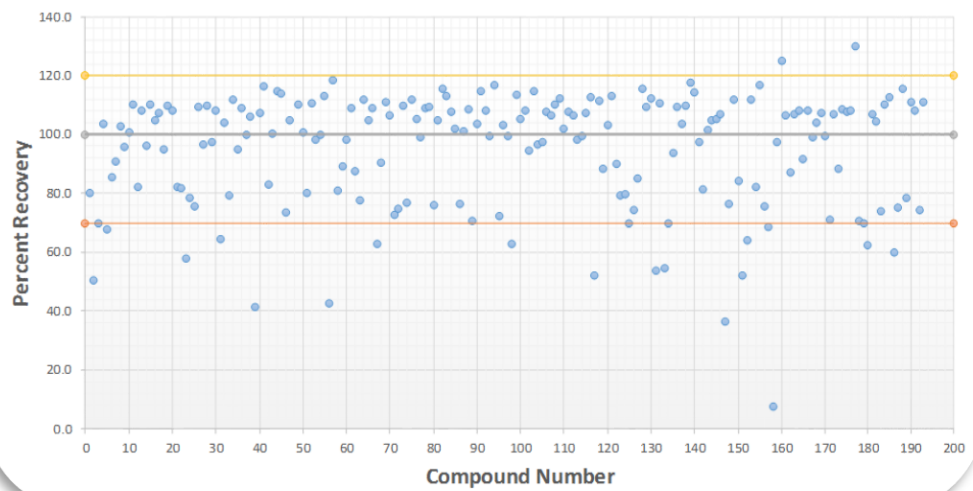
Avocado



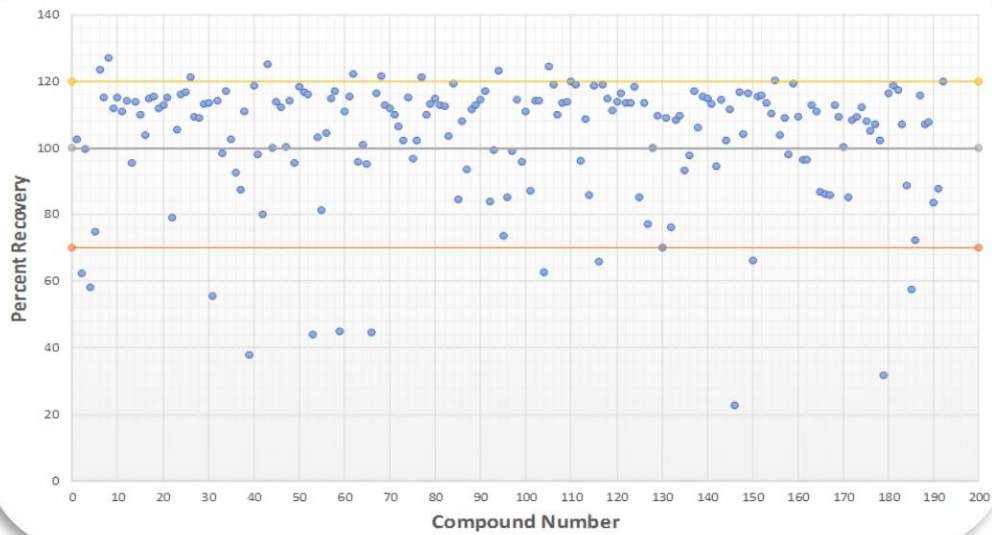
Chicken Fat



Olive Oil



Swordfish



Gravimetric Analysis:

The performance of the LipiFiltr® push-through cartridges to remove lipids and other matrix components was evaluated gravimetrically by collecting 2 mL of sample before and after cleanup in pre-weighed test tubes and heating them to dryness at 110 °C in an oven.

Matrix	Matrix Removal (%)
Beef	79.1
Black Olives	84.3
Avocado	54.7
Salmon	80.9
Chicken fat	71.7
Olive oil	61.5
Nuts	84.3
Swordfish	80.9

Extract Concentration Before and After LipiFiltr® Cleanup:

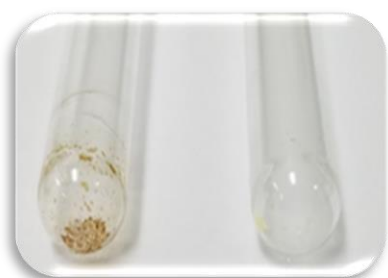


Figure 3. Beef

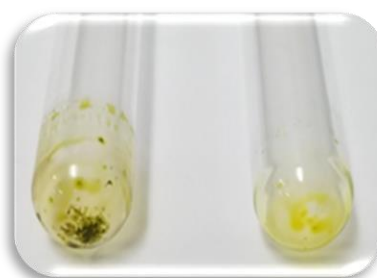


Figure 4. Black Olives

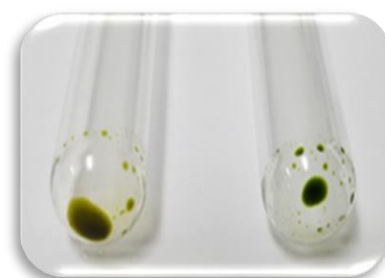


Figure 5. Avocado

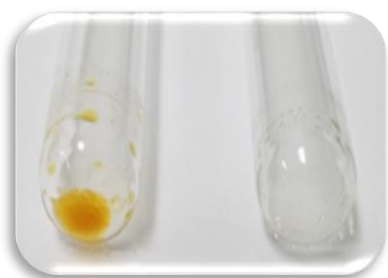


Figure 6. Salmon

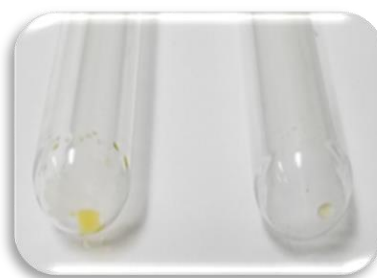


Figure 7. Chicken Fat



Figure 8. Olive Oil

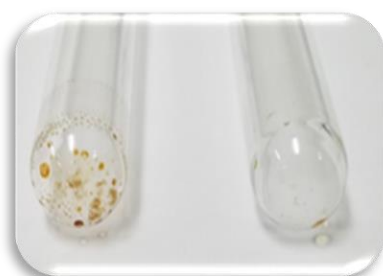


Figure 9. Nuts

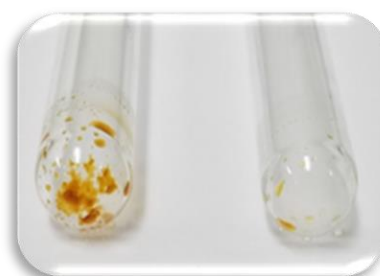


Figure 10. Sword Fish



Supplemental Recovery Data LipiFiltr® Clean-up

Beef

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	94.0	2.4
Acephate	57.2	9.0
Acetamidprid	99.1	5.5
Aldicarb	91.7	2.4
Aldicarb Sulfoxide	65.6	6.0
Aldoxycarb	104.6	1.7
Ametryn	99.2	2.1
Aminocarb	117.8	1.8
Amitraz	91.9	3.6
Azoxystrobin	95.9	7.5
Benalaxyl	102.3	0.0
Bendiocarb	102.1	4.8
Bifenazate	64.6	18.4
Boscalid	98.2	11.0
Bromuconazole 1	104.4	4.3
Bromuconazole 2	92.5	7.3
Bupirimate	100.5	0.4
Buprofezin	109.2	3.8
Butafenacil	100.4	5.5
Butoxycarboxim	116.2	8.2
Carbaryl	99.6	0.8
Carbendazim	75.2	5.3
Carbetamide	100.9	6.2
Carbofuran	99.6	3.6
Carboxin	99.1	2.3
Carfentrazone-ethyl	104.5	3.4
Chloantranilprole	101.6	3.2
Chlorfluazuron	100.7	3.4
Chlorotoluron	100.7	5.2
Chloroxuron	96.6	7.4
Clethodim	49.2	3.0
Clofentazine	99.3	1.4
Clothianidin	104.5	3.6
Cyazofamid	105.5	1.7
Cycluron	91.4	7.7
Cyproconazole 1	96.1	9.8
Cyproconazole 2	94.2	0.6
Cyprodinil	100.6	6.4
Cyromazine	30.7	3.8
Desmedipham	102.4	1.2
Diclobutrazol	104.2	5.6
Diclotophos	75.1	1.8
Diethofencarb	106.5	7.0
Difenoconazole	94.8	7.8
Diflubenzuron	103.9	1.4
Dimethoate	102.9	6.7
Dimethomorph	92.2	0.6
Dimoxystrobin	99.0	2.7
Diniconazole	93.1	2.0
Dinotefuran	101.0	2.4
Dioxacarb	106.2	7.7
Diuron	96.6	1.4
Emamectin B1a	53.5	6.7
Epoxiconazole	98.1	3.3
Eprinomectin	67.0	8.4
Etaconazole	96.0	0.1
Ethiofencarb	100.1	2.2
Ethiprole	101.4	8.2
Ethirimol	50.9	3.5
Ethofumesate	101.8	3.7
Etoxazole	100.1	1.7
Fenamidone	106.4	4.0
Fenarimol	91.5	11.2
Fenazaquin	98.2	1.3
Fenbuconazole	101.2	8.2
Fenhexamid	36.1	13.2

Compound	Rec (%)	RSD (%)
Fenobucarb	101.8	1.1
Fenoxycarb	105.0	0.8
Fenpropimorph	106.8	6.4
Fenpyroximate	100.3	2.6
Fenuron	110.6	10.0
Fipronil	95.8	8.7
Flonicamid	98.0	3.2
Fluazinam	99.7	3.8
Flubendiamide	88.1	15.3
Fludioxonil	91.3	6.6
Flufenacet	101.4	11.4
Flufenoxuron	97.4	4.0
Fluometuron 1	101.8	2.5
Fluometuron 2	97.0	7.2
Fluoxastrobin	98.4	10.2
Fluquinconazole	109.3	4.4
Flusilazole	102.3	2.5
Flutolanil	93.4	10.4
Flutriafol	95.6	2.2
Forchlorfenuron	100.7	1.2
Formetanate	87.1	2.2
Fuberidazole	124.9	11.9
Furalaxyl	100.0	1.5
Furathiocarb	101.7	1.5
Halofenozide	105.2	2.9
Hexaconazole	90.3	3.0
Hexaflumuron	95.3	5.9
Hexythiazox	102.8	2.6
Hydramethylnon	92.8	3.2
Imazalil	89.0	2.3
Imidacloprid	98.7	10.5
Indoxacarb	101.6	6.8
Iproconazole	97.2	1.8
Iprovalicarb	96.8	7.6
Isocarbofos	83.3	5.0
Isoprocarb	99.6	6.1
Isoproturon	97.9	3.2
Ivermectin	64.4	8.3
Kresoxym-methyl	102.5	3.0
Linuron	102.3	1.1
Lufenuron	101.5	1.7
Mandipropamid	100.8	1.1
Mefenacet	100.3	3.1
Mepanipyrim	102.4	1.0
Mepronil	101.5	1.4
Metaflumizone	92.0	2.4
Metalaxyl	98.6	1.5
Metconazole	90.3	3.4
Methabenzthiazuron	103.0	2.8
Methamidophos	63.2	3.2
Methiocarb	102.2	2.5
Methomyl	96.1	0.7
Methoxyprotryne	97.9	5.1
Methoxyfenozide	104.9	4.3
Metobromuron	106.0	1.0
Metribuzin	106.8	4.2
Mevinphos	108.1	2.8
Mexacarbate	117.2	4.6
Monocrotophos	78.6	1.2
Monolinuron	102.6	1.1
Moxidectin	84.7	3.6
Myclobutanil	97.2	2.6
Neburon	103.0	2.3
Nitenpyram	49.1	2.1
Novaluron	80.7	3.9
Omethoate	68.8	2.3

Compound	Rec (%)	RSD (%)
Oxadixyl	97.4	3.3
Oxamyl	93.0	3.1
Pacloubutrazol	92.9	3.4
Penconazole	94.3	1.3
Pencycuron	101.9	1.7
Phenmedipham	98.0	9.9
Picoxystrobin	102.6	2.4
Piperonyl Butoxide	106.2	0.6
Pirimicarb	97.5	0.8
Prochloraz	95.2	0.5
Promecarb	98.5	6.9
Prometon	99.7	1.3
Prometryne	98.4	10.0
Propamocarb	25.6	7.0
Propargite	103.6	2.6
Propiconazole	100.3	1.0
Propoxur	103.8	6.5
Pymetrozine	49.3	1.2
Pyracarbolid	106.6	1.6
Pyraclostrobin	103.5	1.5
Pyridaben	101.5	1.2
Pyrimethanil	112.5	1.0
Pyriproxyfen	106.1	1.6
Quinoxifen	96.3	1.0
Rotenone	100.8	5.2
Secbumeton	104.9	4.5
Siduron	102.7	5.4
Simetryn	100.5	1.8
Spinetoram	89.6	4.2
Spinosad A	88.7	7.3
Spirodiclofen	98.2	2.9
Spiromesifen	123.7	8.0
Spirotetramat	94.8	3.5
Spiroxamine	85.0	7.9
Tebuconazole	89.3	1.8
Tebufenozide	96.5	1.4
Tebufenpyrad	99.3	1.3
Tebuthiuron	86.9	1.9
Teflubenzuron	106.8	0.9
Temephos	102.7	1.3
Terbumeton	106.9	1.8
Terbutryn	101.2	9.7
Tetraconazole	99.7	0.5
Thiabendazole	129.5	9.1
Thiacloprid	103.3	5.8
Thiamethoxam	92.5	1.4
Thidiazuron	71.4	8.9
Thiobencarb	103.2	2.0
Thiofanox	102.5	1.4
Thiophanate-methyl	121.2	5.1
Triadimefon	96.8	10.6
Triadimenol	100.2	1.0
Trichlorfon	54.8	6.8
Tricyclazole	76.6	1.7
Trifloxystrobin	103.7	0.7
Triflumizole	98.3	3.3
Triflumuron	107.1	5.3
Triticonazole	91.8	1.1
Vamidothion	80.0	4.0
Zoxamide	101.6	4.0





Supplemental Recovery Data LipiFiltr® Clean-up

Olives

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	123.4	8.3
Acephate	84.2	3.9
Acetamiprid	107.9	3.8
Aldicarb	88.6	15.2
Aldicarb Sulfoxide	112.2	0.6
Aldoxycarb	120.3	2.4
Ametryn	107.0	4.1
Aminocarb	118.6	1.2
Amitraz	98.0	9.3
Azoxystrobin	105.9	3.7
Benalaxyl	101.3	0.6
Bendiocarb	109.4	2.1
Bifenazate	66.1	10.9
Boscalid	98.5	2.3
Bromuconazole 1	112.2	2.6
Bromuconazole 2	103.6	10.0
Bupirimate	102.9	0.9
Buprofezin	100.5	9.2
Butafenacil	98.6	1.9
Butoxycarboxim	109.7	6.3
Carbaryl	110.9	4.7
Carbendazim	121.2	1.7
Carbetamide	105.7	4.7
Carbofuran	118.9	3.9
Carboxin	99.4	3.1
Carfentrazone-ethyl	100.9	6.9
Chloanthraniliprole	108.0	5.7
Chlorfluazuron	103.0	10.5
Chlorotoluron	106.2	4.7
Chloroxuron	105.2	3.9
Clethodim	83.2	0.6
Clofentazine	106.0	0.7
Clothianidin	113.2	3.1
Cyazofamid	102.7	4.5
Cycluron	104.1	3.3
Cyproconazole 1	110.5	6.9
Cyproconazole 2	118.6	9.5
Cyprodinil	103.7	6.9
Cyromazine	63.1	5.4
Desmedipham	113.2	2.7
Diclobutrazol	104.5	3.6
Dicrotophos	99.1	12.5
Diethofencarb	107.6	4.3
Difenoconazole	103.2	6.5
Diflubenzuron	107.6	3.7
Dimethoate	126.6	12.7
Dimethomorph	95.7	5.3
Dimoxystrobin	102.2	3.4
Diniconazole	104.1	5.4
Dinotefuran	119.6	9.5
Dioxacarb	125.6	8.2
Diuron	106.7	5.1
Emamectin B1a	87.3	3.2
Epoxiconazole	108.8	2.3
Eprinomectin	85.9	11.2
Etaconazole	103.0	4.8
Ethiofencarb	105.3	2.2
Ethiprole	104.0	6.6
Ethirimol	74.3	14.8
Ethofumesate	103.1	6.5
Etoxazole	106.7	3.1
Fenamidone	108.7	5.2
Fenarimol	103.9	3.1
Fenazaquin	89.6	11.1
Fenbuconazole	99.7	11.4
Fenhexamid	66.1	10.9
Fenobucarb	106.7	3.3

Compound	Rec (%)	RSD (%)
Fenoxycarb	104.8	2.3
Fenpropimorph	104.4	4.2
Fenpyroximate	95.0	7.3
Fenuron	114.8	3.3
Fipronil	101.0	5.0
Fonicamid	114.9	3.7
Fluazinam	102.9	8.2
Flubendiamide	105.9	4.7
Fludioxonil	102.3	3.3
Flufenacet	108.4	0.4
Flufenoxuron	104.9	3.8
Fluometuron 1	106.1	4.5
Fluometuron 2	103.9	0.9
Fluoxastrobin	101.8	3.1
Fluquinconazole	105.2	3.9
Flusilazole	104.9	2.3
Flutolanil	106.8	2.7
Flutriafol	105.9	6.5
Forchlorfenuron	114.4	3.4
Formetanate	103.9	6.9
Fuberidazole	116.4	8.3
Furalaxyl	107.5	2.0
Furathiocarb	105.1	2.8
Halofenozide	98.5	3.5
Hexaconazole	105.2	11.7
Hexaflumuron	128.2	9.5
Hexythiazox	104.5	4.4
Hydramethylnon	67.3	6.5
Imazalil	104.7	11.1
Imidacloprid	114.1	7.5
Indoxacarb	108.5	5.3
Ipconazole	106.4	5.3
Iprovalicarb	105.6	2.4
Isocarboxiphos	117.3	7.5
Isoprocab	123.6	5.9
Isoproturon	107.1	2.5
Ivermectin	64.1	12.9
Kresoxym-methyl	106.3	4.6
Linuron	102.1	4.7
Lufenuron	108.2	7.3
Mandipropamid	105.4	1.2
Mefenacet	105.4	1.7
Mepanipyrim	106.7	5.7
Mepronil	104.3	3.4
Metaflumizone	105.5	9.4
Metalaxyl	105.6	3.6
Metconazole	107.7	6.8
Methabenzthiazuron	119.7	1.0
Methamidophos	37.5	9.6
Methiocarb	105.8	3.1
Methomyl	120.1	4.8
Methoprotryne	108.2	2.5
Methoxyfenozide	100.5	2.0
Metobromuron	106.3	1.8
Metribuzin	114.4	3.0
Mevinphos	112.1	2.9
Mexacarbate	108.1	4.6
Monocrotophos	109.1	10.5
Monolinuron	106.4	0.9
Moxidectin	113.0	3.5
Myclobutanil	97.4	6.0
Neburon	116.0	4.0
Nitenpyram	93.8	3.0
Novaluron	131.7	5.9
Omethoate	98.7	10.2
Oxadixyl	108.0	1.8
Oxamyl	106.8	4.1

Compound	Rec (%)	RSD (%)
Paclobutrazol	104.7	4.9
Penconazole	103.9	4.2
Pencycuron	108.6	5.7
Phenmedipham	117.0	6.8
Picoxystrobin	108.0	3.8
Piperonyl Butoxide	102.2	7.6
Pirimicarb	107.5	1.2
Prochloraz	101.9	4.6
Promecarb	106.9	1.9
Prometon	99.3	3.1
Prometryne	103.4	3.2
Propamocarb	61.8	5.0
Propargite	105.1	7.3
Propiconazole	109.8	3.3
Propoxur	108.3	3.2
Pymetrozine	114.4	2.5
Pyracarbolid	109.6	2.7
Pyraclostrobin	105.0	5.5
Pyridaben	102.4	4.6
Pyrimethanil	103.8	1.5
Pyriproxyfen	98.6	11.9
Quinoxifen	108.5	3.1
Rotenone	100.3	3.5
Secbumeton	108.3	5.0
Siduron	105.3	1.0
Simetryn	110.9	2.5
Spinetoram	98.8	2.8
Spinosad A	100.5	1.9
Spirodiclofen	101.3	4.8
Spiromesifen	107.9	11.2
Spirotetramat	101.1	13.2
Spiroxamine	103.7	6.4
Tebuconazole	101.5	5.5
Tebufenozide	99.6	6.1
Tebufenpyrad	103.3	4.2
Tebuthiuron	108.3	6.4
Teflubenzuron	120.1	7.7
Temephos	103.0	6.8
Terbumeton	103.4	6.6
Terbutryn	104.4	3.5
Tetraconazole	108.5	1.5
Thiabendazole	128.3	8.7
Thiacloprid	117.1	8.0
Thiamethoxam	119.0	14.8
Thidiazuron	98.8	3.9
Thiobencarb	106.7	6.4
Thiofanox	102.8	1.8
Thiophanate-methyl	128.7	8.7
Triadimefon	98.5	1.6
Triadimenol	105.8	8.0
Trichlorfon	95.6	5.0
Tricyclazole	111.5	2.4
Trifloxystrobin	101.3	3.7
Triflumizole	106.1	3.0
Triflumuron	109.2	3.1
Triticonazole	107.5	6.1
Vamidotion	116.4	6.8
Zoxamide	110.1	3.7



Supplemental Recovery Data LipiFiltr® Clean-up

Nuts

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	78.8	4.8
Acephate	52.2	3.1
Acetamiprid	80.3	1.1
Aldicarb	66.4	5.3
Aldicarb Sulfoxide	62.3	1.0
Aldoxycarb	93.8	1.1
Ametryn	91.2	1.6
Aminocarb	99.9	3.4
Amitraz	90.9	8.9
Azoxystrobin	92.1	2.2
Benalaxyl	88.5	0.9
Bendiocarb	88.0	0.8
Bifenazate	76.6	12.4
Boscalid	92.4	2.1
Bromuconazole 1	84.7	1.8
Bromuconazole 2	85.9	5.5
Bupirimate	91.4	2.5
Buprofezin	90.8	2.4
Butafenacil	94.5	1.1
Butoxycarboxim	91.9	2.6
Carbaryl	94.4	5.6
Carbendazim	69.8	7.4
Carbetamide	83.5	0.7
Carbofuran	93.7	2.1
Carboxin	92.2	1.4
Carfentrazone-ethyl	93.3	3.3
Chloantranilprole	92.0	3.8
Chlorfluazuron	84.9	1.5
Chlorotoluron	90.4	1.2
Chloroxuron	88.2	3.3
Clethodim	48.6	7.5
Clofentazine	86.3	3.0
Clothianidin	81.7	1.7
Cyazofamid	92.7	2.4
Cycluron	86.6	0.9
Cyproconazole 1	89.4	2.7
Cyproconazole 2	80.0	4.4
Cyprodinil	79.4	3.2
Cyromazine	35.9	12.2
Desmedipham	91.1	7.3
Diclobutrazol	82.1	3.1
Diclotophos	68.3	3.3
Diethofencarb	97.7	1.2
Difenoconazole	88.1	7.3
Difflubenzuron	89.4	1.6
Dimethoate	89.9	1.2
Dimethomorph	87.4	2.9
Dimoxystrobin	91.1	3.3
Diniconazole	82.4	5.0
Dinotefuran	85.9	2.0
Dioxacarb	88.9	1.9
Diuron	92.9	5.1
Emamectin B1a	42.3	11.6
Epoxiconazole	85.5	2.3
Eprinomectin	73.2	12.5
Etaconazole	88.5	6.2
Ethiofencarb	90.1	2.5
Ethiprole	91.6	4.5
Ethirimol	46.3	14.4
Ethofumesate	89.0	2.2
Etoxazole	88.7	1.4
Fenamidone	94.5	2.6
Fenarimol	86.8	6.9
Fenazaquin	88.3	1.3
Fenbuconazole	86.4	4.7
Fenhexamid	37.9	20.0

Compound	Rec (%)	RSD (%)
Fenobucarb	91.9	1.9
Fenoxycarb	91.3	1.2
Fenpropimorph	90.0	2.0
Fenpyroximate	94.4	4.1
Fenuron	89.6	4.6
Fipronil	100.4	6.6
Flonicamid	86.0	4.2
Fluazinam	97.3	6.1
Flubendiamide	86.6	4.9
Fludioxonil	93.9	11.2
Flufenacet	92.3	1.0
Flufenoxuron	88.2	3.1
Fluometuron 1	89.8	0.6
Fluometuron 2	86.2	2.7
Fluoxastrobin	90.3	1.1
Fluquinconazole	80.1	4.9
Flusilazole	88.8	0.9
Flutolanil	92.3	0.6
Flutriafol	79.5	0.5
Forchlorfenuron	86.8	1.3
Formetanate	74.8	2.0
Fuberidazole	88.1	0.8
Furalaxyl	86.6	2.1
Furathiocarb	92.5	0.2
Halofenozide	92.1	6.9
Hexaconazole	73.8	0.8
Hexaflumuron	114.2	5.4
Hexythiazox	87.2	2.6
Hydramethylnon	70.4	4.8
Imazalil	70.0	3.4
Imidacloprid	80.2	6.4
Indoxacarb	93.5	6.1
Ipronazole	77.7	5.7
Iprovalicarb	90.2	1.0
Isocarbophos	70.8	4.3
Isoprocarb	88.1	4.7
Isoproturon	87.9	2.1
Ivermectin	69.6	16.4
Kresoxym-methyl	94.7	3.5
Linuron	92.4	7.0
Lufenuron	93.5	3.0
Mandipropamid	90.6	1.5
Mefenacet	90.0	2.3
Mepanipyrim	97.8	0.3
Mepronil	91.7	0.9
Metaflumizone	119.2	4.6
Metalaxyl	87.3	0.9
Metconazole	74.8	4.3
Methabenzthiazuron	90.9	2.0
Methamidophos	49.5	15.5
Methiocarb	92.3	1.0
Methomyl	88.7	2.2
Methoprotryne	89.5	0.9
Methoxyfenozide	96.1	4.0
Metobromuron	94.9	4.3
Metribuzin	91.7	1.1
Mevinphos	90.9	2.7
Mexacarbate	91.0	1.7
Monocrotophos	75.1	3.6
Monolinuron	90.1	5.4
Moxidectin	90.4	4.4
Myclobutanil	83.8	1.6
Neburon	97.3	5.4
Nitenpyram	51.3	4.7
Novaluron	117.1	7.3
Omethoate	48.9	6.4

Compound	Rec (%)	RSD (%)
Oxadixyl	93.4	0.75
Oxamyl	83.6	3.9
Paclbutrazol	83.5	3.9
Penconazole	81.9	2.8
Pencycuron	88.9	3.8
Phenmedipham	86.6	18.2
Picoxystrobin	90.3	2.4
Piperonyl Butoxide	92.3	1.0
Pirimicarb	84.7	1.9
Prochloraz	84.0	2.8
Promecarb	90.0	4.1
Prometon	87.8	0.2
Prometryne	91.0	3.7
Propamocarb	26.2	11.9
Propargite	91.6	1.3
Propiconazole	73.6	15.2
Propoxur	89.5	1.8
Pymetrozine	48.6	17.1
Pyracarbolid	90.3	1.7
Pyraclostrobin	93.6	3.4
Pyridaben	90.1	0.8
Pyrimethanil	88.2	6.8
Pyriproxyfen	88.6	0.6
Quinoxyfen	89.8	3.2
Rotenone	91.8	1.5
Secbumeton	81.4	11.1
Siduron	91.8	2.0
Simetryn	91.7	1.8
Spinetoram	79.8	0.1
Spinosad A	79.8	2.0
Spirodiclofen	79.6	1.9
Spiromesifen	100.2	6.6
Spirotetramat	86.6	6.9
Spiroxamine	72.4	4.9
Tebuconazole	81.2	2.4
Tebufenozide	89.6	3.1
Tebufenpyrad	93.8	4.4
Tebuthiuron	78.5	1.3
Teflubenzuron	94.6	6.2
Temephos	91.4	1.6
Terbumeton	84.7	0.6
Terbutryn	87.1	4.1
Tetraconazole	84.9	2.1
Thiabendazole	81.4	1.6
Thiacloprid	85.6	1.2
Thiamethoxam	76.7	1.3
Thidiazuron	49.3	14.1
Thiobencarb	95.3	1.7
Thiofanox	89.9	0.4
Thiophanate-methyl	89.9	16.1
Triadimefon	88.8	4.0
Triadimenol	81.2	5.2
Trichlorfon	48.3	19.4
Tricyclazole	64.7	7.2
Trifloxystrobin	89.0	5.8
Triflumizole	89.6	3.5
Triflumuron	86.6	0.9
Triticonazole	77.0	3.8
Vamidotion	71.0	3.8
Zoxamide	94.9	0.7





Supplemental Recovery Data LipiFiltr® Clean-up

Salmon

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	92.5	6.6
Acephate	56.1	1.4
Acetamidrid	96.0	2.1
Aldicarb	58.0	2.2
Aldicarb Sulfoxide	71.9	5.7
Aldoxycarb	100.5	2.8
Ametryn	104.5	2.6
Aminocarb	105.9	4.3
Amitraz	83.3	8.0
Azoxystrobin	104.4	2.4
Benalaxyl	95.8	2.6
Bendiocarb	107.2	4.7
Bifenazate	66.9	4.9
Boscalid	104.3	8.6
Bromuconazole 1	101.5	1.9
Bromuconazole 2	83.7	7.5
Bupirimate	101.1	2.2
Buprofezin	105.7	1.8
Butafenacil	109.6	2.2
Butoxycarboxim	107.5	2.6
Carbaryl	105.3	3.9
Carbendazim	74.6	8.3
Carbetamide	94.3	4.6
Carbofuran	102.5	3.8
Carboxin	105.8	4.1
Carfentrazone-ethyl	107.4	3.8
Chloantranilprole	96.4	1.1
Chlorfluzazuron	95.5	1.9
Chlorotoluron	99.6	6.4
Chloroxuron	101.4	7.1
Clethodim	58.8	7.5
Clofentazine	98.9	4.1
Clothianidin	86.2	5.0
Cyazofamid	106.5	6.4
Cycluron	96.6	5.4
Cyproconazole 1	99.6	6.8
Cyproconazole 2	95.3	1.5
Cyprodinil	94.4	3.5
Cyromazine	31.6	8.4
Desmedipham	108.9	2.4
Diclobutrazol	98.9	4.2
Diclotophos	77.6	2.0
Diethofencarb	107.4	2.4
Difenoconazole	91.3	3.0
Difflubenzuron	102.9	3.3
Dimethoate	95.2	3.3
Dimethomorph	89.1	1.8
Dimoxystrobin	103.7	3.8
Diniconazole	87.5	2.9
Dinotefuran	95.3	3.1
Dioxacarb	105.8	2.9
Diuron	101.6	5.3
Emamectin B1a	41.2	3.2
Epoxiconazole	95.2	1.4
Eprinomectin	71.7	9.8
Etaconazole	95.2	5.6
Ethiofencarb	105.9	3.4
Ethiprole	96.8	4.1
Ethirimol	44.1	6.0
Ethofumesate	100.5	2.5
Etoxazole	99.0	1.7
Fenamidon	102.3	1.5
Fenarimol	89.2	2.4
Fenazaquin	94.7	5.1
Fenbuconazole	93.7	13.2
Fenhexamid	45.8	6.2

Compound	Rec (%)	RSD (%)
Fenobucarb	101.9	3.5
Fenoxycarb	102.2	1.2
Fenpropimorph	104.4	3.7
Fenpyroximate	101.2	4.8
Fenuron	107.7	3.5
Fipronil	93.2	9.2
Flonicamid	88.5	5.4
Fluazinam	110.4	7.5
Flubendiamide	84.3	13.6
Fludioxonil	91.2	11.8
Flufenacet	106.0	3.6
Flufenoxuron	94.6	3.6
Fluometuron 1	102.7	4.6
Fluometuron 2	104.4	1.7
Fluoxastrobin	107.3	2.3
Fluquinconazole	101.2	11.8
Flusilazole	91.3	2.5
Flutolanil	106.1	3.4
Flutriafol	90.9	3.9
Forchlorfenuron	101.8	7.3
Formetanate	75.1	3.4
Fuberidiazole	110.0	1.1
Furalaxyl	101.1	1.8
Furathiocarb	106.6	1.9
Halofenozide	95.6	5.1
Hexaconazole	82.7	5.9
Hexaflumuron	91.3	7.1
Hexythiazox	105.6	8.5
Hydramethylnon	83.8	0.5
Imazalil	80.7	7.6
Imidacloprid	85.3	6.1
Indoxacarb	96.0	0.7
Ipconazole	92.2	5.1
Iprovalicarb	102.8	1.8
Isocarboxiphos	84.5	3.4
Isoprocarb	95.3	0.9
Isoproturon	102.4	3.9
Ivermectin	76.9	2.2
Kresoxym-methyl	104.5	4.5
Linuron	105.8	6.0
Lufenuron	97.9	2.2
Mandipropamid	103.1	0.9
Mefenacet	103.5	7.2
Mepanipyrim	105.4	4.4
Mepropril	104.8	2.1
Metaflumizone	95.4	13.9
Metalaxyl	98.7	3.5
Metconazole	87.9	2.9
Methabenzthiazuron	101.9	4.8
Methamidophos	62.3	5.8
Methiocarb	109.3	6.7
Methomyl	94.8	2.0
Methoprotryne	101.1	2.8
Methoxyfenozide	103.6	3.8
Metobromuron	101.5	2.1
Metribuzin	105.7	3.6
Mevinphos	102.4	5.5
Mexacarbate	106.4	3.8
Monocrotophos	84.2	1.2
Monolinuron	99.4	1.2
Moxidectin	115.2	10.3
Myclobutanil	93.3	3.6
Neburon	95.5	3.5
Nitenpyram	59.7	3.7
Novaluron	115.3	12.3
Omethoate	75.5	0.6

Compound	Rec (%)	RSD (%)
Oxadixyl	106.9	4.3
Oxamyl	91.8	1.5
Paclbutrazol	90.7	3.0
Penconazole	88.2	3.6
Pencycuron	101.3	3.3
Phenmedipham	105.2	6.6
Picoxystrobin	102.0	2.5
Piperonyl Butoxide	102.7	4.6
Pirimicarb	100.8	1.3
Prochloraz	89.6	4.7
Promecarb	105.4	3.1
Prometon	99.5	9.0
Prometryne	102.7	3.6
Propamocarb	24.9	15.1
Propargite	97.5	5.7
Propiconazole	86.3	10.9
Propoxur	102.8	5.2
Pymetrozine	55.4	10.5
Pyracarbolid	106.6	3.7
Pyraclostrobin	100.7	4.0
Pyridaben	99.4	3.8
Pyrimethanil	94.6	6.0
Pyriproxyfen	105.6	12.0
Quinoxifen	96.9	6.1
Rotenone	100.7	2.3
Secbumeton	100.8	9.8
Siduron	99.6	0.8
Simetryn	102.8	1.0
Spinetoram	81.3	2.8
Spinosad A	78.1	5.1
Spirodiclofen	101.5	2.6
Spiromesifen	110.3	1.9
Spirotetramat	85.3	1.3
Spiroxamine	77.2	5.7
Tebuconazole	85.2	1.8
Tebufenozide	97.7	7.8
Tebufenpyrad	97.1	2.9
Tebuthiuron	91.0	5.4
Teflubenzuron	98.3	5.4
Temephos	108.4	9.2
Terbumeton	100.1	2.0
Terbutryn	106.0	1.6
Tetraconazole	99.7	7.6
Thiabendazole	104.6	6.9
Thiacloprid	98.8	3.1
Thiamethoxam	86.7	1.9
Thidiazuron	62.3	10.4
Thiobencarb	104.5	2.7
Thiofanox	109.6	2.2
Thiophanate-methyl	116.0	4.8
Triadimefon	93.5	1.2
Triadimenol	79.0	3.7
Trichlorfon	62.4	3.5
Tricyclazole	72.6	5.1
Trifloxystrobin	103.9	4.2
Triflumizole	98.1	6.1
Triflumuron	100.0	2.8
Triticonazole	82.7	4.2
Vamidotion	80.5	2.4
Zoxamide	103.4	1.6





Supplemental Recovery Data LipiFiltr® Clean-up

Avocado

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	98.6	9.2
Acephate	42.3	12.4
Acetamiprid	96.1	6.2
Aldicarb	82.3	20.1
Aldicarb Sulfoxide	88.4	3.7
Aldoxycarb	118.7	5.0
Ametryn	103.2	4.1
Aminocarb	120.0	3.5
Amitraz	101.4	8.7
Azoxystrobin	100.8	2.3
Benalaxyl	95.8	4.1
Bendiocarb	97.6	2.0
Bifenazate	59.0	11.9
Boscalid	101.1	4.2
Bromuconazole 1	93.3	5.7
Bromuconazole 2	81.3	17.4
Bupirimate	101.3	3.2
Buprofezin	90.0	7.6
Butafenacil	101.8	3.5
Butoxycarboxim	108.5	4.2
Carbaryl	100.4	3.5
Carbendazim	108.3	8.0
Carbetamide	90.7	0.6
Carbofuran	106.8	1.4
Carboxin	52.9	2.3
Carfentrazone-ethyl	103.5	8.8
Chloantranilprole	97.6	5.3
Chlorfluzuron	86.2	4.9
Chlorotoluron	98.0	1.0
Chloroxuron	97.6	3.2
Clethodim	22.8	3.3
Clofentazine	97.8	3.2
Clothianidin	100.1	1.3
Cyazofamid	102.6	0.7
Cycluron	89.4	2.4
Cyproconazole 1	112.0	6.9
Cyproconazole 2	95.8	1.4
Cyprodinil	97.9	7.8
Cyromazine	40.6	19.0
Desmedipham	65.7	4.9
Diclobutrazol	91.9	11.4
Diclotophos	73.3	8.1
Diethofencarb	105.9	2.8
Difenoconazole	92.9	7.0
Difflubenzuron	94.8	5.6
Dimethoate	99.9	2.9
Dimethomorph	93.1	5.3
Dimoxystrobin	96.5	6.6
Diniconazole	86.2	12.2
Dinotefuran	109.4	8.3
Dioxacarb	106.6	1.3
Diuron	99.3	1.3
Emamectin B1a	41.1	11.6
Epoxiconazole	94.7	3.8
Eprinomectin	79.9	9.0
Etaconazole	95.0	4.0
Ethiofencarb	75.5	1.7
Ethiprole	104.5	2.8
Ethirimol	49.9	6.0
Ethofumesate	89.1	7.0
Etoxazole	100.0	4.6
Fenamidone	107.3	5.8
Fenarimol	90.1	6.9
Fenazaquin	82.6	9.7
Fenbuconazole	84.9	7.1
Fenhexamid	34.2	12.1

Compound	Rec (%)	RSD (%)
Fenobucarb	98.1	1.1
Fenoxycarb	103.3	5.1
Fenpropimorph	104.8	4.7
Fenpyroximate	94.4	4.1
Fenuron	99.4	7.6
Fipronil	103.9	2.8
Flonicamid	106.6	9.0
Fluazinam	98.0	5.2
Flubendiamide	104.7	3.4
Fludioxonil	104.0	3.1
Flufenacet	103.7	4.9
Flufenoxuron	95.9	2.4
Fluometuron 1	102.2	2.1
Fluometuron 2	107.0	2.3
Fluoxastrobin	96.6	6.7
Fluquinconazole	96.3	4.2
Flusilazole	96.0	2.4
Flutolanil	102.7	5.3
Flutriafol	80.2	8.5
Forchlorfenuron	102.4	6.1
Formetanate	81.4	3.8
Fuberidiazole	123.9	2.5
Furalaxyl	97.6	2.4
Furathiocarb	94.9	6.1
Halofenozide	104.6	11.1
Hexaconazole	89.3	7.8
Hexaflumuron	102.3	8.8
Hexythiazox	93.9	3.8
Hydramethylnon	40.5	1.7
Imazalil	90.7	9.8
Imidacloprid	87.4	2.5
Indoxacarb	108.9	8.0
Ipronazole	91.3	5.7
Iprovalicarb	101.0	1.2
Isocarbofos	80.3	12.2
Isoprocarb	101.4	1.0
Isoproturon	98.3	3.5
Ivermectin	70.4	12.3
Kresoxym-methyl	101.7	3.4
Linuron	97.1	5.3
Lufenuron	102.3	3.2
Mandipropamid	97.9	2.6
Mefenacet	100.8	1.3
Mepanipyrim	98.5	6.2
Mepropril	101.5	2.2
Metaflumizone	112.1	1.5
Metalaxyl	95.9	0.3
Metconazole	80.3	5.3
Methabenzthiazuron	100.8	3.7
Methamidophos	53.5	5.0
Methiocarb	98.7	2.2
Methomyl	106.0	4.0
Methoprotryne	97.4	1.3
Methoxyfenozide	106.1	7.3
Metobromuron	101.3	2.0
Metribuzin	100.8	1.0
Mevinphos	101.9	1.9
Mexacarbate	107.2	1.9
Monocrotophos	86.3	6.6
Monolinuron	96.4	1.1
Moxidectin	78.1	15.5
Myclobutanil	97.3	3.8
Neburon	91.8	5.2
Nitenpyram	56.7	9.3
Novaluron	113.9	8.9
Omethoate	83.7	4.7

Compound	Rec (%)	RSD (%)
Oxadixyl	95.6	3.8
Oxamyl	104.5	3.2
Paclbutrazol	91.3	8.2
Penconazole	90.6	4.4
Pencycuron	101.3	2.7
Phenmedipham	71.9	11.2
Picoxystrobin	98.2	5.5
Piperonyl Butoxide	90.1	4.1
Pirimicarb	95.5	0.3
Prochloraz	85.5	7.1
Promecarb	100.3	1.1
Prometon	92.0	2.4
Prometryne	100.4	2.5
Propamocarb	24.1	12.8
Propargite	94.8	4.2
Propiconazole	88.8	14.7
Propoxur	101.6	1.0
Pymetrozine	43.8	13.1
Pyracarbolid	98.0	3.2
Pyraclostrobin	93.9	2.0
Pyridaben	95.5	3.2
Pyrimethanil	98.0	12.5
Pyriproxyfen	90.2	2.7
Quinoxifen	93.5	3.2
Rotenone	95.5	7.6
Secbumeton	86.6	13.2
Siduron	92.6	7.6
Simetryn	100.0	3.6
Spinetoram	80.3	2.7
Spinosad A	84.4	3.0
Spirodiclofen	100.5	6.5
Spiromesifen	88.0	14.0
Spirotetramat	88.1	10.3
Spiroxamine	78.7	4.2
Tebuconazole	82.3	9.7
Tebufenozide	105.6	2.7
Tebufenpyrad	88.5	8.5
Tebuthiuron	91.4	5.0
Teflubenzuron	94.2	10.5
Temphos	91.9	6.2
Terbumeton	102.9	2.8
Terbutryn	101.4	3.2
Tetraconazole	100.9	3.8
Thiabendazole	121.3	7.1
Thiacloprid	98.6	2.3
Thiamethoxam	89.1	8.4
Thidiazuron	35.0	13.4
Thiobencarb	97.6	1.5
Thiofanox	54.7	3.6
Thiophanate-methyl	69.6	3.2
Triadimefon	100.8	2.5
Triadimenol	87.9	11.0
Trichlorfon	23.8	14.2
Tricyclazole	70.6	15.0
Trifloxystrobin	100.7	2.7
Triflumizole	82.7	3.2
Triflumuron	92.7	5.4
Triticonazole	83.8	8.9
Vamidotion	76.4	9.6
Zoxamide	95.8	5.3



Supplemental Recovery Data LipiFiltr® Clean-up

Chicken Fat

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	91.6	4.9
Acephate	65.5	3.6
Acetamiprid	90.4	2.0
Aldicarb	78.1	6.0
Aldicarb Sulfoxide	71.2	1.6
Aldoxycarb	109.3	1.0
Ametryn	99.8	2.0
Aminocarb	116.6	1.2
Amitraz	107.8	4.5
Azoxystrobin	101.9	3.5
Benalaxyl	102.6	0.2
Bendiocarb	99.5	1.0
Bifenazate	112.6	0.5
Boscalid	113.4	4.2
Bromuconazole 1	95.5	5.1
Bromuconazole 2	90.3	2.7
Bupirimate	101.6	3.2
Buprofezin	93.6	2.6
Butafenacil	107.6	1.3
Butoxycarboxim	106.0	3.6
Carbaryl	100.9	2.5
Carbendazim	73.1	9.8
Carbetamide	95.1	1.7
Carbofuran	107.7	0.9
Carboxin	105.5	1.2
Carfentrazone-ethyl	100.8	2.3
Chloantranilprole	101.5	2.2
Chlorfluazuron	82.0	3.3
Chlorotoluron	106.5	0.5
Chloroxuron	100.6	3.4
Clethodim	50.6	6.9
Clofentazine	82.2	2.7
Clothianidin	93.7	4.1
Cyazofamid	97.5	1.2
Cycluron	90.9	4.6
Cyproconazole 1	89.0	1.0
Cyproconazole 2	83.9	4.9
Cyprodinil	107.8	5.9
Cyromazine	34.3	9.4
Desmedipham	101.4	2.4
Diclobutrazol	90.4	5.1
Diclotophos	77.7	4.8
Diethofencarb	104.8	2.0
Difenoconazole	51.4	2.3
Diflubenzuron	95.4	2.5
Dimethoate	94.2	5.3
Dimethomorph	89.4	5.0
Dimoxystrobin	97.4	4.4
Diniconazole	85.0	2.5
Dinotefuran	104.4	2.7
Dioxacarb	93.4	0.8
Diuron	100.9	4.3
Emamectin B1a	48.1	5.9
Epoxiconazole	94.5	2.1
Eprinomectin	60.7	17.4
Etaconazole	99.4	8.0
Ethiofencarb	102.3	0.3
Ethiprole	101.2	1.6
Ethirimol	49.4	6.4
Ethofumesate	91.9	1.8
Etoxazole	112.3	2.2
Fenamidone	95.2	0.6
Fenarimol	98.2	3.4
Fenazaquin	65.5	2.9
Fenbuconazole	85.1	5.0
Fenhexamid	38.6	13.2

Compound	Rec (%)	RSD (%)
Fenobucarb	105.1	1.1
Fenoxycarb	100.9	0.8
Fenpropimorph	106.7	0.4
Fenpyroximate	87.0	2.2
Fenuron	97.2	3.3
Fipronil	109.1	2.8
Flonicamid	83.9	8.2
Fluazinam	120.6	3.5
Flubendiamide	108.2	2.0
Fludioxonil	118.6	5.1
Flufenacet	95.2	1.0
Flufenoxuron	111.5	2.4
Fluometuron 1	101.9	0.7
Fluometuron 2	97.4	1.5
Fluoxastrobin	99.9	1.2
Fluquinconazole	97.1	10.7
Flusilazole	98.2	2.1
Flutolanil	113.5	3.1
Flutriafol	84.8	8.7
Forchlorfenuron	98.8	2.5
Formetanate	81.9	1.8
Fuberidazole	127.7	0.2
Furalaxyl	101.7	3.8
Furathiocarb	102.5	2.3
Halofenozide	99.8	1.5
Hexaconazole	84.1	4.5
Hexaflumuron	115.6	2.8
Hexythiazox	93.1	1.0
Hydramethylnon	93.9	9.1
Imazalil	88.1	3.8
Imidacloprid	99.4	5.0
Indoxacarb	110.8	2.9
Ipconazole	85.9	4.1
Iprovalicarb	98.5	1.5
Isocarbophos	85.4	5.8
Isoprocarb	97.0	6.0
Isoproturon	102.5	1.2
Ivermectin	49.5	19.8
Kresoxym-methyl	95.1	2.0
Linuron	109.9	2.5
Lufenuron	110.0	2.3
Mandipropamid	107.9	0.8
Mefenacet	98.0	1.5
Mepanipyrim	93.0	2.6
Mepronil	105.7	1.8
Metaflumizone	130.3	0.5
Metalaxyl	99.1	2.1
Metconazole	81.9	4.0
Methabenzthiazuron	108.7	1.2
Methamidophos	50.5	10.9
Methiocarb	109.0	3.7
Methomyl	112.3	3.3
Methoprotryne	97.6	2.3
Methoxyfenozide	94.4	1.1
Metobromuron	106.7	1.3
Metribuzin	103.4	4.3
Mevinphos	96.2	1.7
Mexacarbate	106.5	2.1
Monocrotophos	81.6	4.0
Monolinuron	102.0	3.9
Moxidectin	64.7	19.2
Myclobutanil	97.3	4.7
Neburon	103.9	1.6
Nitenpyram	45.5	17.9
Novaluron	121.4	3.3
Omethoate	80.7	5.3

Compound	Rec (%)	RSD (%)
Oxadixyl	97.0	0.9
Oxamyl	97.4	2.8
Paclbutrazol	99.1	2.0
Penconazole	96.1	3.5
Pencycuron	92.6	0.9
Phenmedipham	102.6	9.0
Picoxystrobin	103.4	1.3
Piperonyl Butoxide	99.7	1.6
Pirimicarb	101.1	2.0
Prochloraz	87.4	2.3
Promecarb	110.2	0.7
Prometon	96.0	2.5
Prometryne	100.1	1.6
Propamocarb	25.3	2.9
Propargite	99.6	0.7
Propiconazole	94.3	1.5
Propoxur	101.4	3.2
Pymetrozine	55.5	3.0
Pyracarbolid	106.2	0.5
Pyraclostrobin	93.8	0.8
Pyridaben	98.7	0.2
Pyrimethanil	98.5	2.5
Pyriproxyfen	99.4	1.6
Quinoxifen	96.0	2.7
Rotenone	107.3	5.3
Secbumeton	101.9	2.1
Siduron	106.5	1.3
Simetryn	99.4	0.6
Spinetoram	85.9	4.2
Spinosad A	87.3	2.5
Spirodiclofen	108.5	3.1
Spiromesifen	83.9	15.9
Spirotetramat	93.6	4.0
Spiroxamine	83.1	2.0
Tebuconazole	84.0	1.5
Tebufenozide	104.6	4.1
Tebufenpyrad	103.5	5.2
Tebuthiuron	86.9	2.0
Teflubenzuron	114.5	14.2
Temephos	99.7	3.1
Terbumeton	114.8	2.9
Terbutryn	101.5	1.2
Tetraconazole	97.8	2.9
Thiabendazole	113.2	6.5
Thiacloprid	98.9	3.1
Thiamethoxam	97.1	3.9
Thidiazuron	63.6	10.0
Thiobencarb	97.3	2.1
Thiofanox	104.3	2.4
Thiophanate-methyl	107.0	0.5
Triadimefon	100.4	2.2
Triadimenol	87.9	7.4
Trichlorfon	53.6	7.2
Tricyclazole	75.4	5.2
Trifloxystrobin	94.5	3.2
Triflumizole	94.3	0.8
Triflumuron	94.7	2.2
Triticonazole	85.1	5.3
Vamidotion	81.4	2.9
Zoxamide	100.1	1.2



Supplemental Recovery Data LipiFiltr® Clean-up

Olive Oil

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	80.1	1.3
Acephate	50.6	5.1
Acetamidrid	70.0	1.5
Aldicarb	103.6	0.7
Aldicarb Sulfoxide	67.9	4.6
Aldoxycarb	85.6	1.3
Ametryn	90.7	0.6
Aminocarb	102.8	0.4
Amitraz	96.0	4.3
Azoxystrobin	100.6	2.0
Benalaxyl	110.4	1.4
Bendiocarb	82.2	3.1
Bifenazate	108.3	0.7
Boscalid	96.3	2.6
Bromuconazole 1	110.0	2.3
Bromuconazole 2	104.7	5.9
Bupirimate	107.5	1.6
Buprofezin	95.0	5.8
Butafenacil	109.9	3.5
Butoxycarboxim	108.0	8.2
Carbaryl	82.2	6.7
Carbendazim	81.7	2.8
Carbetamide	58.0	3.6
Carbofuran	78.6	1.7
Carboxin	75.4	1.3
Carfentrazone-ethyl	109.4	1.2
Chloantraniliprole	96.7	6.6
Chlorfluazuron	109.9	0.8
Chlorotoluron	97.2	2.7
Chloroxuron	108.1	1.2
Clethodim	64.5	6.7
Clofentazine	103.9	4.5
Clothianidin	79.4	5.6
Cyazofamid	111.7	2.1
Cycluron	94.8	2.0
Cyproconazole 1	109.1	5.1
Cyproconazole 2	100.1	3.9
Cyprodinil	106.0	3.6
Cyromazine	41.2	2.8
Desmedipham	107.3	0.7
Diclobutrazol	116.3	2.9
Diclotophos	83.1	2.7
Diethofencarb	100.4	2.7
Difenoconazole	114.9	3.4
Difflubenzuron	113.9	2.4
Dimethoate	73.7	3.9
Dimethomorph	104.7	1.1
Dimoxystrobin	110.1	1.2
Diniconazole	100.8	1.1
Dinotefuran	80.1	1.4
Dioxacarb	110.8	5.1
Diuron	98.2	1.9
Emamectin B1a	99.8	3.7
Epoxiconazole	113.1	0.5
Eprinomectin	42.7	8.3
Etaconazole	118.5	2.3
Ethiofencarb	80.8	5.2
Ethiprole	89.3	5.1
Ethirimol	98.2	4.2
Ethofumesate	109.1	0.4
Etoxazole	87.6	4.0
Fenamidone	77.8	1.0
Fenarimol	111.9	2.3
Fenazaquin	104.8	0.8
Fenbuconazole	109.1	11.1
Fenhexamid	62.7	4.7

Compound	Rec (%)	RSD (%)
Fenobucarb	90.4	3.4
Fenoxycarb	111.0	1.2
Fenpropimorph	106.3	4.1
Fenpyroximate	72.6	1.8
Fenuron	74.9	3.9
Fipronil	109.8	5.3
Flonicamid	76.9	3.3
Fluazinam	111.8	3.6
Flubendiamide	105.3	10.4
Fludioxonil	99.1	11.3
Flufenacet	109.1	2.4
Flufenoxuron	109.2	0.7
Fluometuron 1	76.1	3.2
Fluometuron 2	104.8	0.6
Fluoxastrobin	115.5	3.2
Fluquinconazole	113.3	3.7
Flusilazole	107.8	1.2
Flutolanil	102.0	1.5
Flutriafol	76.5	1.8
Forchlorfenuron	101.2	2.1
Formetanate	108.8	1.5
Fuberidazole	70.7	4.6
Furalaxyl	103.8	0.5
Furathiocarb	114.7	2.5
Halofenozide	108.0	2.7
Hexaconazole	99.5	1.1
Hexaflumuron	117.0	1.8
Hexythiazox	72.2	1.4
Hydramethylnon	103.2	6.2
Imazalil	99.5	4.0
Imidacloprid	62.7	3.0
Indoxacarb	113.3	1.5
Ipconazole	105.3	1.4
Iprovalicarb	108.3	1.8
Isocarbofos	94.5	2.3
Isoprocarb	114.6	6.3
Isoproturon	96.5	1.5
Ivermectin	97.6	8.7
Kresoxym-methyl	107.9	3.8
Linuron	106.6	1.1
Lufenuron	110.0	2.3
Mandipropamid	112.1	0.9
Mefenacet	102.1	2.5
Mepanipyrim	107.7	7.4
Mepropril	106.5	0.9
Metaflumizone	98.2	1.8
Metalaxyl	99.5	0.9
Metconazole	107.4	0.3
Methabenzthiazuron	112.5	3.9
Methamidophos	52.2	5.1
Methiocarb	111.3	3.0
Methomyl	88.2	3.1
Methoprotryne	103.0	1.8
Methoxyfenozide	113.0	3.7
Metobromuron	90.0	1.5
Metribuzin	79.1	0.8
Mevinphos	79.8	3.6
Mexacarbate	69.8	2.3
Monocrotophos	74.4	2.7
Monolinuron	85.0	2.0
Moxidectin	115.6	4.2
Myclobutanil	109.5	0.1
Neburon	112.2	1.6
Nitenpyram	53.7	8.2
Novaluron	110.4	14.1
Omethoate	54.5	3.9

Compound	Rec (%)	RSD (%)
Oxadixyl	70.0	1.4
Oxamyl	93.6	1.0
Paclbutrazol	109.4	3.8
Penconazole	103.5	0.8
Pencycuron	109.7	1.1
Phenmedipham	117.6	4.9
Picoxystrobin	114.2	3.2
Piperonyl Butoxide	97.4	1.3
Pirimicarb	81.3	2.4
Prochloraz	101.6	2.0
Promecarb	104.9	3.2
Prometon	105.4	3.9
Prometryne	106.9	2.9
Propamocarb	36.5	3.9
Propargite	76.3	1.2
Propiconazole	112.0	4.6
Propoxur	84.2	3.1
Pymetrozine	52.0	4.5
Pyracarbolid	64.2	1.6
Pyraclostrobin	111.9	1.2
Pyridaben	82.3	1.7
Pyrimethanil	116.9	3.6
Pyriproxyfen	75.4	2.3
Quinoxifen	68.5	1.3
Rotenone	7.7	2.3
Secbumeton	97.6	2.9
Siduron	124.9	2.9
Simetryn	106.6	1.9
Spinetoram	87.1	2.4
Spinosad A	106.8	0.4
Spirodiclofen	108.0	1.3
Spiromesifen	91.8	10.6
Spirotetramat	108.2	2.2
Spiroxamine	99.0	3.4
Tebuconazole	103.9	0.5
Tebufenozide	107.2	2.4
Tebufenpyrad	99.4	0.8
Tebuthiuron	71.1	4.6
Teflubenzuron	106.8	6.5
Temephos	88.3	1.4
Terbumeton	108.6	4.2
Terbutryn	107.6	5.5
Tetraconazole	108.1	3.7
Thiabendazole	130.1	6.3
Thiacloprid	70.5	3.5
Thiamethoxam	70.0	1.8
Thidiazuron	62.5	7.0
Thiobencarb	106.8	3.7
Thiofanox	104.4	3.9
Thiophanate-methyl	74.0	2.4
Triadimefon	110.4	1.6
Triadimenol	112.5	3.0
Trichlorfon	60.1	3.1
Tricyclazole	75.0	4.5
Trifloxystrobin	115.4	1.6
Triflumizole	78.6	0.2
Triflumuron	111.0	1.8
Triticonazole	108.1	1.4
Vamidotion	74.3	2.1
Zoxamide	111.1	2.5





Supplemental Recovery Data LipiFiltr® Clean-up

Swordfish

Compound	Rec (%)	RSD (%)
3-hydroxycarbofuran	102.7	3.1
Acephate	62.2	7.2
Acetamiprid	99.5	2.2
Aldicarb	58.2	2.9
Aldicarb Sulfoxide	75.0	4.2
Aldoxycarb	123.6	2.4
Ametryn	115.2	1.6
Aminocarb	127.2	2.0
Amitraz	111.9	6.0
Azoxystrobin	115.0	2.0
Benalaxyl	110.8	1.6
Bendiocarb	114.3	2.7
Bifenazate	95.7	2.4
Boscalid	113.8	0.3
Bromuconazole 1	110.0	3.3
Bromuconazole 2	104.0	6.2
Bupirimate	115.0	3.8
Buprofezin	115.3	1.6
Butafenacil	111.9	4.1
Butoxycarboxim	113.0	2.6
Carbaryl	115.2	1.4
Carbendazim	79.2	2.0
Carbetamide	105.5	1.4
Carbofuran	116.2	0.9
Carboxin	116.8	1.9
Carfentrazone-ethyl	121.3	3.7
Chloantraniliprole	109.5	3.8
Chlorfluazuron	109.1	1.9
Chlorotoluron	113.3	2.5
Chloroxuron	113.4	4.0
Clethodim	55.6	12.4
Clofentazine	114.2	2.6
Clothianidin	98.4	2.5
Cyazofamid	117.0	0.9
Cycluron	102.5	1.4
Cyproconazole 1	92.5	10.1
Cyproconazole 2	87.4	12.2
Cyprodinil	111.0	1.9
Cyromazine	37.8	10.8
Desmedipham	118.8	2.8
Diclobutrazol	98.1	6.6
Dicrotophos	79.9	2.7
Diethofencarb	125.0	1.8
Difenoconazole	99.9	2.8
Diflubenzuron	113.9	2.7
Dimethoate	112.3	1.4
Dimethomorph	100.4	2.7
Dimoxystrobin	114.3	3.1
Diniconazole	95.5	3.9
Dinotefuran	118.4	1.8
Dioxacarb	116.8	1.9
Diuron	116.2	3.7
Emamectin B1a	43.9	2.5
Epoxiconazole	103.4	3.8
Eprinomectin	81.4	6.2
Etaconazole	104.6	2.1
Ethiofencarb	114.7	2.9
Ethiprole	117.2	4.7
Ethirimol	44.9	7.3
Ethofumesate	111.0	1.4
Etoxazole	115.4	2.6
Fenamidon	122.1	0.7
Fenarimol	95.9	4.9
Fenazaquin	100.9	3.1
Fenbuconazole	95.1	7.2
Fenhexamid	44.7	3.7
Fenobucarb	116.3	1.9

Compound	Rec (%)	RSD (%)
Fenoxycarb	121.5	1.6
Fenpropimorph	112.9	1.3
Fenpyroximate	112.1	3.8
Fenuron	109.9	2.8
Fipronil	106.4	8.0
Flonicamid	102.2	3.6
Fluazinam	115.2	1.3
Flubendiamide	96.8	7.3
Fludioxonil	102.3	9.0
Flufenacet	121.2	1.0
Flufenoxuron	109.9	1.7
Fluometuron 1	113.3	0.3
Fluometuron 2	114.8	1.3
Fluoxastrobin	112.8	4.8
Fluquinconazole	112.5	4.9
Flusilazole	103.6	4.3
Flutolanil	119.2	1.4
Flutriafol	84.5	2.7
Forchlorfenuron	108.0	2.1
Formetanate	93.6	1.2
Fuberiazole	111.7	1.7
Furalaxyl	112.8	1.8
Furathiocarb	114.6	5.0
Halofenozide	116.9	1.8
Hexaconazole	83.8	4.6
Hexaflumuron	99.4	9.2
Hexythiazox	123.2	2.4
Hydramethylnon	73.6	13.2
Imazalil	85.3	4.2
Imidacloprid	99.1	3.9
Indoxacarb	114.4	2.7
Ipconazole	95.8	7.1
Iprovalicarb	110.8	0.9
Isocarboxiphos	87.0	2.2
Isoprocarb	114.2	5.0
Isoproturon	114.1	1.5
Ivermectin	62.7	8.8
Kresoxym-methyl	124.3	0.9
Linuron	119.0	2.1
Lufenuron	110.1	2.2
Mandipropamid	113.6	0.3
Mefenacet	113.8	1.6
Mepanipyrim	119.9	4.7
Mepronil	118.9	2.7
Metaflumizone	96.3	6.5
Metalaxyl	108.8	1.6
Metconazole	85.8	2.1
Methabenzthiazuron	118.6	0.4
Methamidophos	66.0	9.5
Methiocarb	119.0	3.1
Methomyl	114.8	3.1
Methoprotryne	111.2	1.5
Methoxyfenozide	114.0	3.3
Metobromuron	116.5	1.8
Metribuzin	113.5	4.6
Mevinphos	113.4	1.6
Mexacarbate	118.5	0.3
Monocrotophos	85.1	4.2
Monolinuron	113.6	4.2
Moxidectin	77.3	14.2
Myclobutanil	100.0	0.9
Neburon	109.8	0.8
Nitenpyram	70.0	3.8
Novaluron	109.0	7.7
Omethoate	76.3	7.8
Oxadixyl	108.4	1.3
Oxamyl	109.6	2.0

Compound	Rec (%)	RSD (%)
Paclbutrazol	93.2	2.4
Penconazole	97.6	1.8
Pencycuron	117.0	1.8
Phenmedipham	106.2	2.8
Picoxystrobin	115.3	1.2
Piperonyl Butoxide	114.7	2.6
Pirimicarb	113.0	2.1
Prochloraz	94.5	1.2
Promecarb	114.6	2.0
Prometon	102.3	1.1
Prometryne	111.7	2.0
Propamocarb	22.6	1.4
Propargite	116.7	2.6
Propiconazole	104.1	1.8
Propoxur	116.5	2.3
Pymetrozine	66.3	2.6
Pyracarbolid	115.6	2.0
Pyraclostrobin	115.6	4.7
Pyridaben	113.6	1.0
Pyrimethanil	110.4	4.7
Pyriproxyfen	120.1	1.3
Quinoxifen	104.0	1.2
Rotenone	108.9	7.1
Secbumeton	98.0	15.6
Siduron	119.4	2.2
Simetryn	109.2	2.6
Spinetoram	96.5	2.1
Spinosad A	96.6	1.3
Spirodiclofen	113.0	2.9
Spiromesifen	110.9	23.8
Spirotetramat	86.8	5.9
Spiroxamine	86.1	3.1
Tebuconazole	86.0	5.1
Tebufenozide	112.9	3.4
Tebufenpyrad	109.5	3.8
Tebuthiuron	100.3	1.9
Teflubenzuron	85.4	9.4
Temephos	108.3	2.6
Terbumeton	109.3	3.7
Terbutryn	112.1	2.1
Tetraconazole	107.9	5.9
Thiabendazole	105.1	1.2
Thiacloprid	107.0	0.8
Thiamethoxam	102.3	3.4
Thidiazuron	31.7	5.8
Thiobencarb	116.6	2.0
Thiofanox	118.7	0.9
Thiophanate-methyl	117.2	2.8
Triadimefon	107.2	2.4
Triadimenol	88.8	3.8
Trichlorfon	57.6	3.2
Tricyclazole	72.2	3.0
Trifloxystrobin	115.8	3.5
Triflumizole	107.2	2.3
Triflumuron	107.7	0.8
Triticonazole	83.6	2.9
Vamidithion	87.7	0.9
Zoxamide	120.1	1.5