European Union Reference Laboratory for Pesticide Residues in Fruits & Vegetables

EUPT-FV-24

European Proficiency Test FV-24

EUPT-FV24 Results

Tomatoes

Mandatory Target List

211 pesticides

No new compounds introduced in 2022

Acephate
Acetamiprid
Aclonifen
Acrinathrin
Aldicarb
Aldicarb Sulfone
Aldicarb Sulfoxide
Aldrin
Ametoctradin
Azinphos-methyl
Azoxystrobin
Bifenthrin (sum of isomers)
Biphenyl
Bitertanol (sum of isomers)
Boscalid
Bromopropylate
Bromuconazole (sum of diastereoisomers)
Bupirimate
Buprofezin
Cadusafos
Carbaryl
Carbendazim
Carbofuran
Carbofuran-3-hydroxy
Chlorantraniliprole
Chlorfenapyr
Chlorfenvinphos
Chlorobenzilate
Chlorothalonil
Chlorpropham
Chlorpyrifos
Chlorpyrifos-methyl
Clofentezine
Clothianidin
Cyantraniliprole
Cyazofamid
Cyflufenamid: sum of cyflufenamid (Z-isomer) and its E-isomer
Cyfluthrin (cyfluthrin incl. other mixtures of constituent isomers (sum of isomers))
Cymoxanil
Cypermethrin (cypermethrin incl. other mixtures of constituent isomers (sum of isomers))
Cyproconazole
Cyprodinil
Deltamethrin (cis-deltamethrin)
Demeton-S-methylsulfone
Diazinon
Dichlofluanid
Dichlorvos
Dicloran
Dicofol (sum of p, p´ and o,p´ isomers)
Dieldrin
Diethofencarb
Difenoconazole
Diflubenzuron
Dimethoate
Dimethomorph (sum of isomers)
Dimethylaminosulfotoluidide (DMST)
Diniconazole (sum of isomers)
Diphenylamine
Endosulfan alpha
Endosulfan beta
Endosulfan sulfate
EPN
Epoxiconazole
Ethion
Ethirimol
Ethoprophos
Etofenprox
Etoxazole
Famoxadone
Fenamidone
Fenamiphos
Fenamiphos sulfone
Fenamiphos sulfoxide
Fenarimol
Fenazaquin
Fenbuconazole
Fenhexamid
Fenitrothion
Fenoxycarb
Fenpropathrin
Fenpropidin
Fenpropimorph (sum of isomers)
Fenpyrazamine
Fenpyroximate
Fenthion
Fenthion oxon
Fenthion oxon sulfone
Fenthion oxon sulfoxide
Fenthion sulfone
Fenthion sulfoxide
Fenvalerate (any ratio of constituent isomers (RR, SS, RS & SR) including esfenvalerate)
Fipronil
Fipronil sulfone
Flonicamid
Flubendiamide
Fludioxonil
Flufenoxuron
Fluopicolide
Fluopyram
Fluquinconazole

Mandatory Target List

211 pesticides

No new compounds introduced in 2022

Flusilazole
Flutolanil
Flutriafol
Fluxapyroxad
Fosthiazate
Hexaconazole
Hexythiazox
Imazalil
Imidacloprid
Indoxacarb (sum of indoxacarb and its R enantiomer)
Iprodione
Iprovalicarb
Isocarbophos
Isofenphos-methyl
Isoprothiolane
Kresoxim-methyl
Lambda-Cyhalothrin
Linuron
Lufenuron (any proportion of constituent isomers)
Malaoxon

Flusilazole
Flutolanil
Flutriafol
Fluxapyroxad
Fosthiazate
Hexaconazole
Hexythiazox
Imazalil
Imidacloprid
Indoxacarb (sum of indoxacarb and its R enantiomer)
Iprodione
Iprovalicarb
Isocarbophos
Isofenphos-methyl
Isoprothiolane
Kresoxim-methyl
Lambda-Cyhalothrin
Linuron
Lufenuron (any proportion of constituent isomers)
Malaoxon

Malathion
Mandipropamid
Mepanipyrim
Metaflumizone (sum of E- and Z- isomers)
Metalaxyl and metalaxyl-M
Methamidophos
Methidathion
Methiocarb
Methiocarb sulfone
Methiocarb sulfoxide
Methomyl
Methoxyfenozide
Metrafenone
Monocrotophos
Myclobutanyl
Omethoate
Orthophenylphenol (Free compound only)
Oxadixyl
Oxamyl
Oxydemeton-methyl

Paclobutrazole
Paraoxon-methyl
Parathion-ethyl
Parathion-methyl
Penconazole
Pencycuron
Pendimethalin
Permethrin (sum of isomers)
Phenthoate
Phosalone
Phosmet
Phosmet oxon
Phoxim
Pirimicarb
Pirimicarb-desmethyl
Pirimiphos-methyl
Prochloraz (only parent compound)
Procymidone
Profenofos
Propamocarb (only parent compound)

Spiroxamine (sum of isomers)
Sulfoxaflor (sum of isomers)
Tau-Fluvalinate
Tebuconazole
Tebufenozide
Tebufenpyrad
Teflubenzuron
Tefluthrin
Terbuthylazine
Tetraconazole
Tetradifon
Thiabendazole
Thiacloprid
Thiamethoxam
Thiodicarb
Thiophanate-methyl
Tolclofos-methyl
Tolylfluanid
Triadimefon
Triadimenol (any proportion of constituent isomers)

Triazophos
Trichlorfon
Tricyclazole
Trifloxystrobin
Triflumizole
Triflumizole metabolite (FM-6-1)
Triflumuron
Trifluralin
Triticonazole
Vinclozolin (only parent compound)
Zoxamide

Voluntary Target List

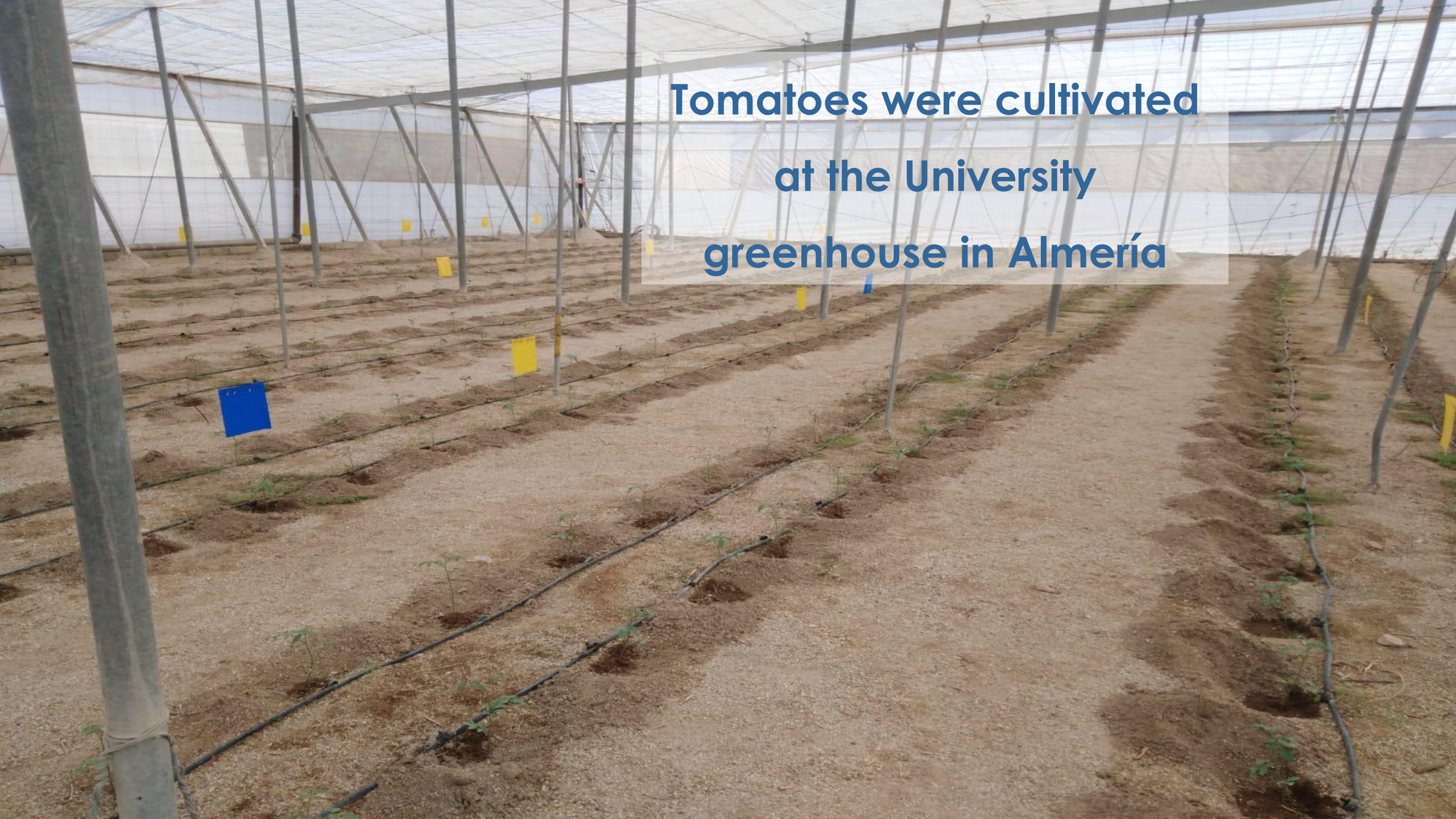
43 pesticides

Working Document SANCO/12745/2013

(Working document on pesticides to be considered for inclusion in the national control programmes to ensure compliance with maximum residue levels of pesticides residues in and on food of plant and animal origin)

Benalaxyl and benalaxyl-M
Benzovindiflupyr
Chlorfluazuron
Clomazone
Cyhalofop-butyl
Dinotefuran
Fenobucarb
Fenpicoxamid
Florpyrauxifen-benzyl
Fluensulfone
Flufenacet (only parent compound)
Flutianil
Flupyradifurone
Heptachlor
***cis*- Heptachlor epoxide**
***trans* -Heptachlor epoxide**
Isofetamid
Isopyrazam
Isoxaflutole
Isoxaflutole diketonitrile degradate
Mefentrifluconazole
Metconazole (sum of isomers)
Molinate
Novaluron
Oxadiargyl
Oxathiapiprolin
Oxyfluorfen
Penflufen
Pentachloro-aniline
Penthiopyrad
Picolinafen
Propaquizafop
Pyrethrins
Pyridate (only parent compound)
Pyriofenone
Quinalphos
Quinoclamine
Quintozene
Rotenone
Tetramethrin
Tolfenpyrad
Tri-allate
Tritosulfuron

1 New compound


Tomatoes were cultivated
at the University
greenhouse in Almería

The same tomato plants were used for the EUPT-SRM17 material

2021

September

Planting

2021

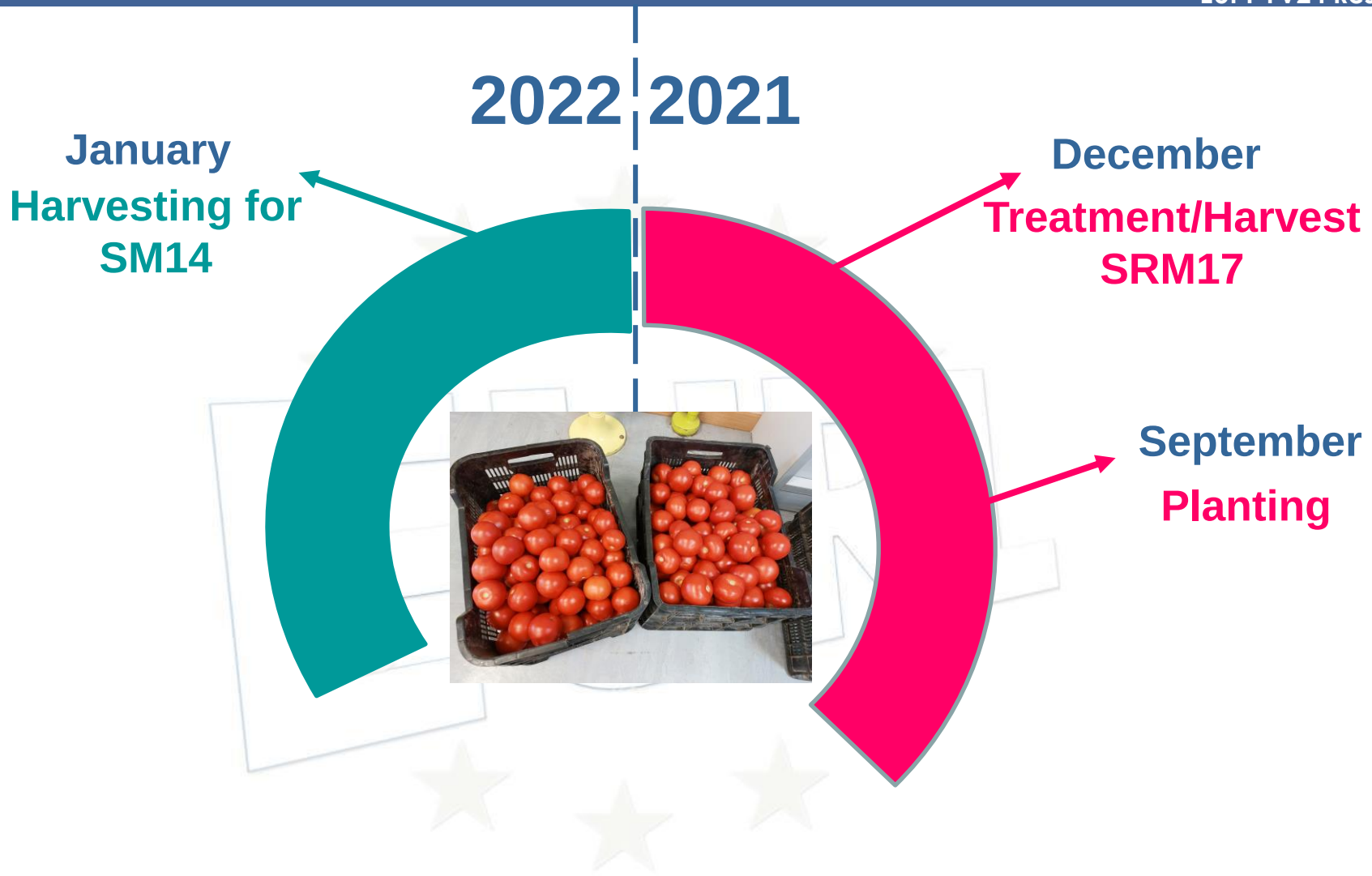
December

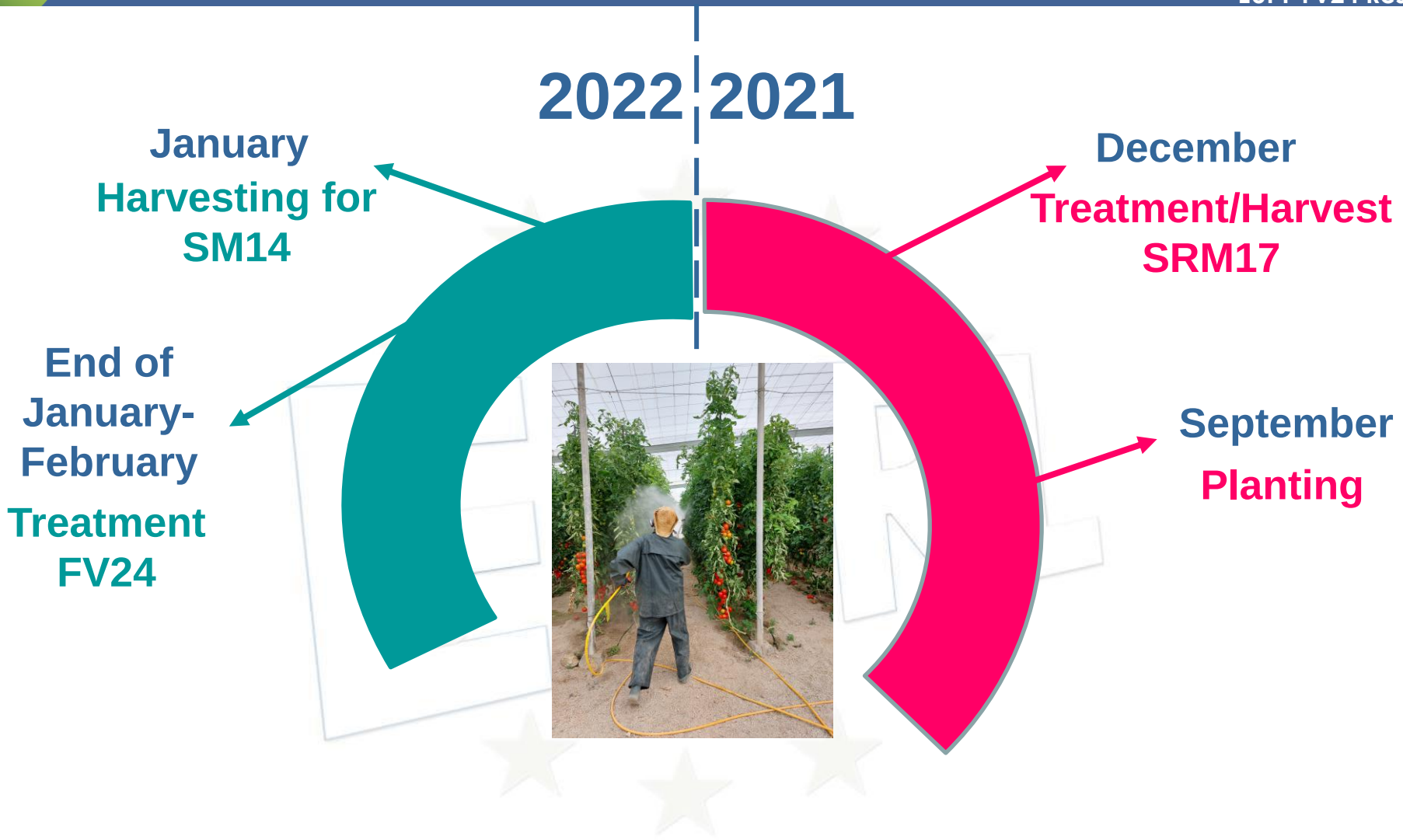
Treatment/Harvest

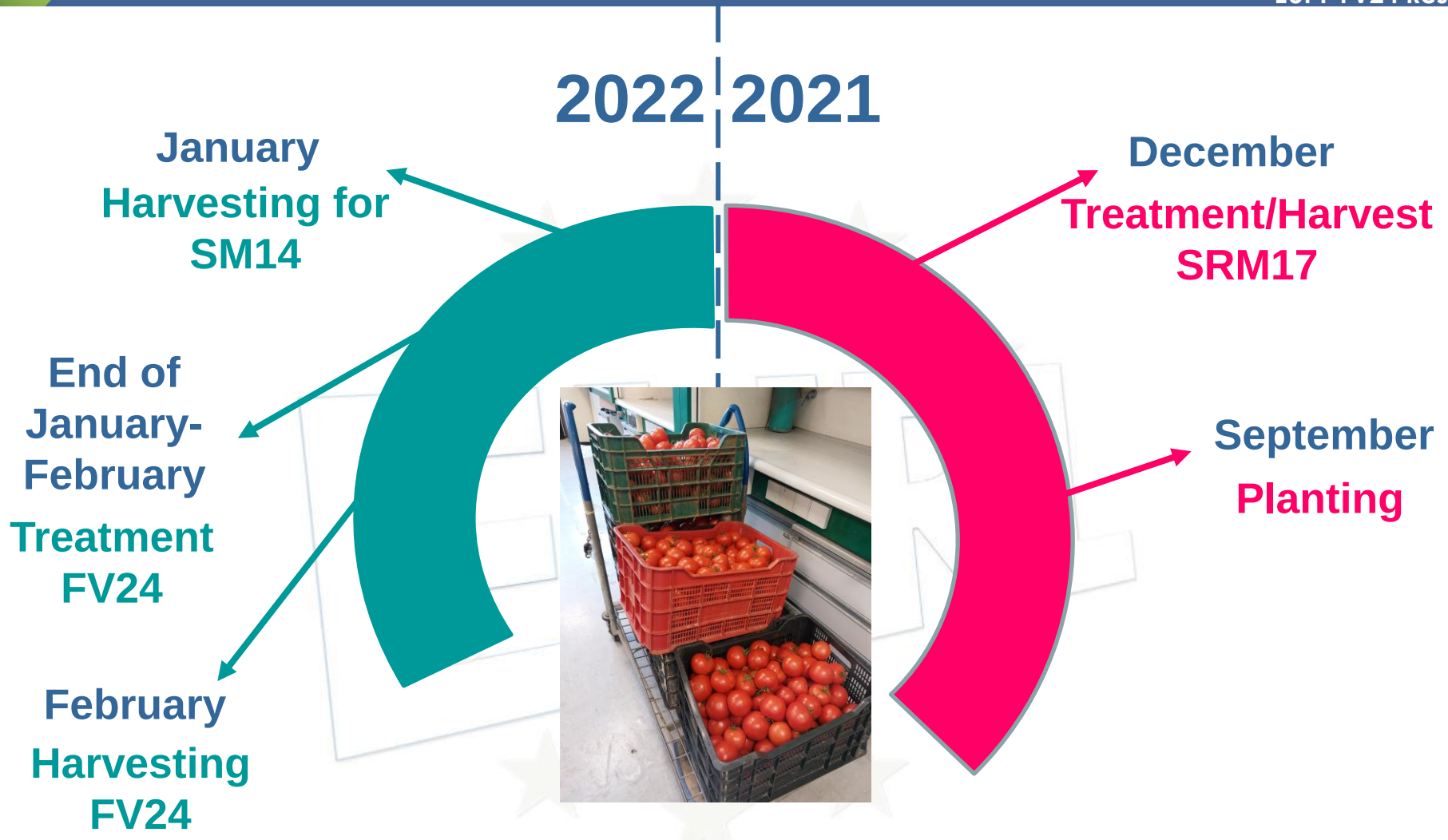
SRM17

September

Planting


2022
2021
January
Harvesting for
SM14
December
Treatment/Harvest
SRM17
September
Planting


2022
2021
January
Harvesting for SM14
End of January-February
Treatment FV24
December
Treatment/Harvest SRM17
September
Planting


2022
2021
January
Harvesting for SM14
December
Treatment/Harvest SRM17
End of January-February
Treatment FV24
September
Planting
February
Harvesting FV24

Pesticides used for the treatment	
Chlorothalonil (SRM17)	
	Propamocarb (SRM17)
	Pymetrozine (SRM17)
Flonicamid (SRM17)	
TOTAL 22	

Pesticides used for the treatment	
Acetamiprid	Fluopyram
Azoxystrobin	Flupyradifurone
Buprofezin	Isofetamid
Chlorfenvinphos	Oxamyl
	Oxydemeton-methyl
Chlorpyrifos	Procymidone
Deltamethrin	
Diazinon	
Fenamiphos	Spinosyn A
Fenamiphos sulfoxide	Spinosyn D
	Zoxamide
TOTAL 22	

Voluntary pesticides

Pesticides used for the treatment	
Acetamiprid	**Fluopyram**
Azoxystrobin	**Flupyradifurone**
Buprofezin	**Isofetamid**
Chlorfenvinphos	**Oxamyl**
Chlorothalonil (SRM17)	**Oxydemeton-methyl**
Chlorpyrifos	**Procymidone**
Deltamethrin	Propamocarb (SRM17)
Diazinon	Pymetrozine (SRM17)
Fenamiphos	**Spinosyn A**
Fenamiphos sulfoxide	**Spinosyn D**
Flonicamid (SRM17)	**Zoxamide**
TOTAL 22	

Voluntary pesticides

Preparation of the test item

Before harvest, the tomatoes were treated with pesticides available as commercial formulations

Acetamiprid

Azoxystrobin

Buprofezin

Fenamiphos

Oxamyl

No blank material was sent

Preparation of the test item

After harvest, tomatoes were processed, and all the processed material (tomato puree) was spiked with analytical standards

Chlorfenvinphos

Chlorpyrifos

Deltamethrin

Diazinon

Fluopyram

Flupyradifurone

Isofetamid

Oxydemeton-methyl

Procymidone

Spinosad

Zoxamide

Preparation of the test item

Pesticides applied as analytical standards

- Chlorfenvinphos
- Chlorpyrifos
- Deltamethrin
- Diazinon
- Fluopyram
- Flupyradifurone
- Isofetamid
- Oxydemeton-methyl
- Procymidone
- Spinosad
- Zoxamide

11 pesticides

Pesticides applied as commercial formulations

- Acetamiprid
- Azoxystrobin
- Buprofezin
- Fenamiphos
- Oxamyl

5 pesticides

Preparation of the test item

Pesticides applied as analytical standards

Chlorfenvinphos
Chlorpyrifos
Deltamethrin
Diazinon
Fluopyram
Flupyradifurone
Isofetamid
Oxydemeton-methyl
Procymidone
Spinosad
Zoxamide

11 pesticides

Pesticides applied as commercial formulations

Acetamiprid
Azoxystrobin
Buprofezin
Fenamiphos
Oxamyl

5 pesticides

Chlorothalonil (SRM17)
Flonicamid (SRM17)
Propamocarb (SRM17)
Pymetrozine (SRM17)

Preparation of the test item

Pesticides applied as analytical standards

Chlorfenvinphos
Chlorpyrifos
Deltamethrin
Diazinon
Fluopyram
Flupyradifurone
Isofetamid
Oxydemeton-methyl
Procymidone
Spinosad
Zoxamide

11 pesticides

Pesticides applied as commercial formulations

Acetamiprid
Azoxystrobin
Buprofezin
Fenamiphos
Oxamyl

9 pesticides

Chlorothalonil (SRM17)
Flonicamid (SRM17)
Propamocarb (SRM17)
Pymetrozine (SRM17)

Preparation of the test item

All the material was homogeneised and distributed in zip plastic bags

Preparation of the test item

The plastic bags were kept in the freezer for several days, until completely frozen.

Afterwards, the iced tomato puree was minced with an ice crusher

Preparation of the test item

The material was bottled and kept in the freezer prior to shipment to participants

Homogeneity

The homogeneity of the test item was studied using the 2006 Harmonised Protocol.

Homogeneity

Pesticide	Mean Conc. (mg/Kg)	Ss^2	c	Ss^2 < c Pass/Fail
Acetamiprid	0.1058	6,167E-07	4,00E-05	Pass
Azoxystrobin	0,089	8,889E-08	9,00E-05	Pass
Buprofezin	0,072	9,789E-06	6,00E-05	Pass
Chlorfenvinphos	0.067	4,478E-06	6,00E-05	Pass
Chlorpyrifos	0.055	1,565E-05	4.00E-05	Pass
Chlorothalonil	0.016	4,389E-07	0	Pass
Deltamethrin	0,052	2,081E-05	4,00E-05	Pass
Diazinon	0.443	4,661E-04	2,25E-03	Pass
Fenamiphos-sulfoxide	0.020	7,222E-08	0	Pass
Fenamiphos	0.059	1,756E-06	4,00E-05	Pass
Flonicamid	0.098	5,261E-06	1.10E-04	Pass
Fluopyram	0.430	1,677E-06	2,19E-03	Pass
Flupyradifurone*	0.062	1,767E-06	5,00E-05	Pass
Isofetamid*	0,043	1,756E-06	2,00E-05	Pass
Oxamyl	0.088	7,322E-06	9,00E-05	Pass
Oxidemeton metil	0,111	1,111E-05	1,50E-04	Pass
Pymetrozine	0,012	4,944E-07	0	Pass
Procymidone	0,156	1,167E-05	2,70E-04	Pass
Propamocarb	0,597	2,717E-04	4,24E-03	Pass
Spinosad	0.145	0	2,60E-04	Pass
Zoxamide	0.039	2,267E-06	2,000E-05	Pass

Homogeneity

Pesticide	Mean Conc. (mg/Kg)	Ss^2	c	Ss^2 < c Pass/Fail
Acetamiprid	0.1058	6,167E-07	4,00E-05	Pass
Azoxystrobin	0,089	8,889E-08	9,00E-05	Pass
Buprofezin	0,072	9,789E-06	6,00E-05	Pass
Chlorfenvinphos	0.067	4,478E-06	6,00E-05	Pass
Chlorpyrifos	0.055	1,565E-05	4.00E-05	Pass
Chlorothalonil	0.016	4.389E-07	0	Pass
Deltamethrin				Pass
Diazinon				Pass
Fenamiphos-sulfoxide				Pass
Fenamiphos				Pass
Flonicamid				Pass
Fluopyram	0.430	1,677E-06	2,19E-03	Pass
Flupyradifurone*	0.062	1,767E-06	5,00E-05	Pass
Isofetamid*	0,043	1,756E-06	2,00E-05	Pass
Oxamyl	0.088	7,322E-06	9,00E-05	Pass
Oxidemeton metil	0,111	1,111E-05	1,50E-04	Pass
Pymetrozine	0,012	4,944E-07	0	Pass
Procymidone	0,156	1,167E-05	2,70E-04	Pass
Propamocarb	0,597	2,717E-04	4,24E-03	Pass
Spinosad	0.145	0	2,60E-04	Pass
Zoxamide	0.039	2,267E-06	2,000E-05	Pass

All the pesticides passed the homogeneity test

Stability

- *1st Analysis - prior to the sample shipment*
- *2nd Analysis - after the deadline for reporting results*
- *3rd Analysis - reproducing the delivery conditions that the samples experienced during **48 hours***
- *4th Analysis - reproducing the delivery conditions that the samples experienced during **72 hours***

Stability

- *1st Analysis - prior to the sample shipment*
- *2nd Analysis - after the deadline for reporting results*
- *3rd Analysis - reproduci... experienced during **48***
- *4th Analysis - reproducing the delivery conditions that the samples experienced during **72 hours***

All the pesticides passed the stability test

Stability

(mg/kg)	Day 1							Day 2								
	Sample 98_A	Sample 98_B	Sample 162_A	Sample 162_B	Sample 183_A	Sample 183_B	Mean 1	Sample 185_A	Sample 185_B	Sample 246_A	Sample 246_B	Sample 44_A	Sample 44_B	Mean 2	(M2 – M1)	M2-M1 ≤ 0.3*σ
Acetamiprid	0,056	0,051	0,055	0,055	0,057	0,058	0,055	0,055	0,053	0,054	0,055	0,057	0,056	0,055	0,000	Pass
Azoxystrobin	0,110	0,096	0,100	0,099	0,110	0,110	0,104	0,110	0,100	0,110	0,110	0,110	0,100	0,107	0,003	Pass
Buprofezin	0,070	0,070	0,063	0,065	0,062	0,066	0,066	0,069	0,069	0,064	0,071	0,071	0,071	0,069	0,003	Pass
Chlorfenvinphos	0,070	0,074	0,060	0,061	0,061	0,062	0,065	0,069	0,064	0,065	0,068	0,073	0,071	0,068	0,004	Pass
Chlorpyrifos	0,060	0,060	0,049	0,051	0,050	0,052	0,054	0,056	0,052	0,051	0,055	0,061	0,059	0,056	0,002	Pass
Deltamethrin	0,062	0,064	0,052	0,050	0,049	0,050	0,055	0,056	0,051	0,051	0,052	0,063	0,063	0,056	0,002	Pass
Diazinon	0,760	0,750	0,750	0,710	0,690	0,740	0,733	0,760	0,740	0,780	0,770	0,790	0,760	0,767	0,033	Pass
Fenamiphos	0,067	0,061	0,065	0,063	0,068	0,070	0,066	0,067	0,065	0,070	0,070	0,072	0,066	0,068	0,003	Pass
Flonicamid	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,000	Pass
Fluopyram	0,510	0,510	0,500	0,500	0,510	0,570	0,517	0,560	0,510	0,510	0,540	0,540	0,550	0,535	0,018	Pass
Oxamyl	0,091	0,085	0,088	0,088	0,083	0,089	0,087	0,094	0,093	0,087	0,087	0,094	0,090	0,091	0,003	Pass
Oxidemeton methyl	0,120	0,110	0,120	0,120	0,120	0,120	0,118	0,120	0,120	0,120	0,120	0,120	0,120	0,120	0,002	Pass
Procymidone	0,170	0,170	0,150	0,150	0,160	0,150	0,158	0,160	0,150	0,150	0,160	0,170	0,170	0,160	0,002	Pass
Propamocarb	0,660	0,650	0,650	0,650	0,660	0,720	0,665	0,710	0,640	0,630	0,660	0,700	0,700	0,673	0,008	Pass
Spinosad	0,160	0,150	0,150	0,160	0,160	0,170	0,158	0,160	0,160	0,160	0,160	0,170	0,160	0,162	0,003	Pass
Zoxamide	0,048	0,044	0,046	0,045	0,050	0,051	0,047	0,049	0,048	0,050	0,051	0,054	0,051	0,051	0,003	Pass
Voluntary Pesticides																
Flupyradifurone	0,077	0,068	0,074	0,071	0,074	0,078	0,074	0,074	0,074	0,073	0,074	0,076	0,072	0,074	0,000	Pass
Isofetamid	0,048	0,044	0,046	0,045	0,050	0,052	0,048	0,050	0,048	0,049	0,049	0,053	0,050	0,050	0,002	Pass

Stability

(mg/kg)	Day 1							Day 3								
	Sample 98_A	Sample 98_B	Sample 162_A	Sample 162_B	Sample 183_A	Sample 183_B	Mean 1	Sample 33_A	Sample 33_B	Sample 39_A	Sample 39_B	Sample 40_A	Sample 40_B	Mean 3	(M3 – M1)	M3-M1 ≤ 0.3*σ
Acetamiprid	0,056	0,051	0,055	0,055	0,057	0,058	0,055	0,058	0,056	0,053	0,052	0,053	0,050	0,054	-0,002	**Pass**
Azoxystrobin	0,110	0,096	0,100	0,099	0,110	0,110	0,104	0,120	0,120	0,100	0,100	0,094	0,096	0,105	0,001	**Pass**
Buprofezin	0,070	0,070	0,063	0,065	0,062	0,066	0,066	0,061	0,071	0,072	0,070	0,060	0,060	0,066	0,000	**Pass**
Chlorfenvinphos	0,070	0,074	0,060	0,061	0,061	0,062	0,065	0,062	0,072	0,071	0,072	0,062	0,061	0,067	0,002	**Pass**
Chlorpyrifos	0,060	0,060	0,049	0,051	0,050	0,052	0,054	0,055	0,062	0,060	0,061	0,054	0,051	0,057	0,004	**Pass**
Deltamethrin	0,062	0,064	0,052	0,050	0,049	0,050	0,055	0,054	0,061	0,063	0,062	0,048	0,047	0,056	0,001	**Pass**
Diazinon	0,760	0,750	0,750	0,710	0,690	0,740	0,733	0,790	0,840	0,760	0,770	0,600	0,620	0,730	-0,003	**Pass**
Fenamiphos	0,067	0,061	0,065	0,063	0,068	0,070	0,066	0,076	0,072	0,063	0,062	0,058	0,058	0,065	-0,001	**Pass**
Flonicamid	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,000	**Pass**
Fluopyram	0,510	0,510	0,500	0,500	0,510	0,570	0,517	0,570	0,580	0,500	0,530	0,490	0,470	0,523	0,007	**Pass**
Oxamyl	0,091	0,085	0,088	0,088	0,083	0,089	0,087	0,090	0,090	0,095	0,094	0,094	0,092	0,093	0,005	**Pass**
Oxidemeton methyl	0,120	0,110	0,120	0,120	0,120	0,120	0,118	0,120	0,120	0,110	0,110	0,110	0,110	0,113	-0,005	**Pass**
Procymidone	0,170	0,170	0,150	0,150	0,160	0,150	0,158	0,150	0,170	0,170	0,170	0,150	0,150	0,160	0,002	**Pass**
Propamocarb	0,660	0,650	0,650	0,650	0,660	0,720	0,665	0,660	0,680	0,650	0,710	0,710	0,660	0,678	0,013	**Pass**
Spinosad	0,160	0,150	0,150	0,160	0,160	0,170	0,158	0,170	0,170	0,160	0,160	0,150	0,140	0,158	0,000	**Pass**
Zoxamide	0,048	0,044	0,046	0,045	0,050	0,051	0,047	0,057	0,055	0,047	0,045	0,040	0,041	0,048	0,000	**Pass**
Voluntary Pesticides																
Flupyradifurone	0,077	0,068	0,074	0,071	0,074	0,078	0,074	0,076	0,074	0,073	0,074	0,072	0,069	0,073	-0,001	**Pass**
Isofetamid	0,048	0,044	0,046	0,045	0,050	0,052	0,048	0,058	0,054	0,047	0,046	0,041	0,040	0,048	0,000	**Pass**

Stability

(mg/kg)	Day 1							Day 4								
	Sample 98_A	Sample 98_B	Sample 162_A	Sample 162_B	Sample 183_A	Sample 183_B	Mean 1	Sample 60_A	Sample 60_B	Sample 119_A	Sample 119_B	Sample 121_A	Sample 121_B	Mean 4	(M4 – M1)	M4-M1 ≤ 0.3*σ
Acetamiprid	0,056	0,051	0,055	0,055	0,057	0,058	0,055	0,054	0,053	0,052	0,057	0,058	0,057	0,055	0,000	Pass
Azoxystrobin	0,110	0,096	0,100	0,099	0,110	0,110	0,104	0,098	0,095	0,098	0,100	0,110	0,110	0,102	-0,002	Pass
Buprofezin	0,070	0,070	0,063	0,065	0,062	0,066	0,066	0,068	0,074	0,063	0,072	0,077	0,073	0,071	0,005	Pass
Chlorfenvinphos	0,070	0,074	0,060	0,061	0,061	0,062	0,065	0,066	0,070	0,066	0,070	0,073	0,070	0,069	0,005	Pass
Chlorpyrifos	0,060	0,060	0,049	0,051	0,050	0,052	0,054	0,054	0,057	0,052	0,058	0,060	0,060	0,057	0,003	Pass
Deltamethrin	0,062	0,064	0,052	0,050	0,049	0,050	0,055	0,055	0,058	0,054	0,061	0,063	0,063	0,059	0,005	Pass
Diazinon	0,760	0,750	0,750	0,710	0,690	0,740	0,733	0,770	0,690	0,760	0,740	0,790	0,830	0,763	0,030	Pass
Fenamiphos	0,067	0,061	0,065	0,063	0,068	0,070	0,066	0,061	0,060	0,062	0,067	0,069	0,066	0,064	-0,002	Pass
Flonicamid	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,110	0,120	0,110	0,112	0,002	Pass
Fluopyram	0,510	0,510	0,500	0,500	0,510	0,570	0,517	0,510	0,540	0,500	0,510	0,560	0,530	0,525	0,008	Pass
Oxamyl	0,091	0,085	0,088	0,088	0,083	0,089	0,087	0,089	0,088	0,087	0,094	0,099	0,094	0,092	0,004	Pass
Oxidemeton methyl	0,120	0,110	0,120	0,120	0,120	0,120	0,118	0,120	0,120	0,110	0,120	0,120	0,120	0,118	0,000	Pass
Procymidone	0,170	0,170	0,150	0,150	0,160	0,150	0,158	0,160	0,170	0,150	0,170	0,170	0,160	0,163	0,005	Pass
Propamocarb	0,660	0,650	0,650	0,650	0,660	0,720	0,665	0,690	0,740	0,640	0,660	0,710	0,680	0,687	0,022	Pass
Spinosad	0,160	0,150	0,150	0,160	0,160	0,170	0,158	0,150	0,150	0,150	0,160	0,170	0,160	0,157	-0,002	Pass
Zoxamide	0,048	0,044	0,046	0,045	0,050	0,051	0,047	0,045	0,044	0,044	0,047	0,049	0,049	0,046	-0,001	Pass
Voluntary Pesticides																
Flupyradifurone	0,077	0,068	0,074	0,071	0,074	0,078	0,074	0,072	0,073	0,073	0,076	0,077	0,074	0,074	0,001	Pass
Isofetamid	0,048	0,044	0,046	0,045	0,050	0,052	0,048	0,043	0,043	0,044	0,048	0,050	0,048	0,046	-0,002	Pass

EUPT-FV24 CALENDAR

ACTIVITY	DATE
Registration period	6th December 2021- 11th February 2022
Specific Protocol published on the Web site.	21st February 2022 at the latest
Selection of the scope	24th February – 7th March 2022
Sample distribution.	7th March 2022
Deadline for receiving sample acceptance	11th March 2022
Deadline for receiving results	4th April 2022
Filling in additional information, if necessary.	5th – 13th April 2022
Preliminary Report: (containing preliminary assigned values and z scores)	April 2022
Final Report distributed to the Laboratories.	August 2022

EUPT-FV24 CALENDAR

ACTIVITY	DATE
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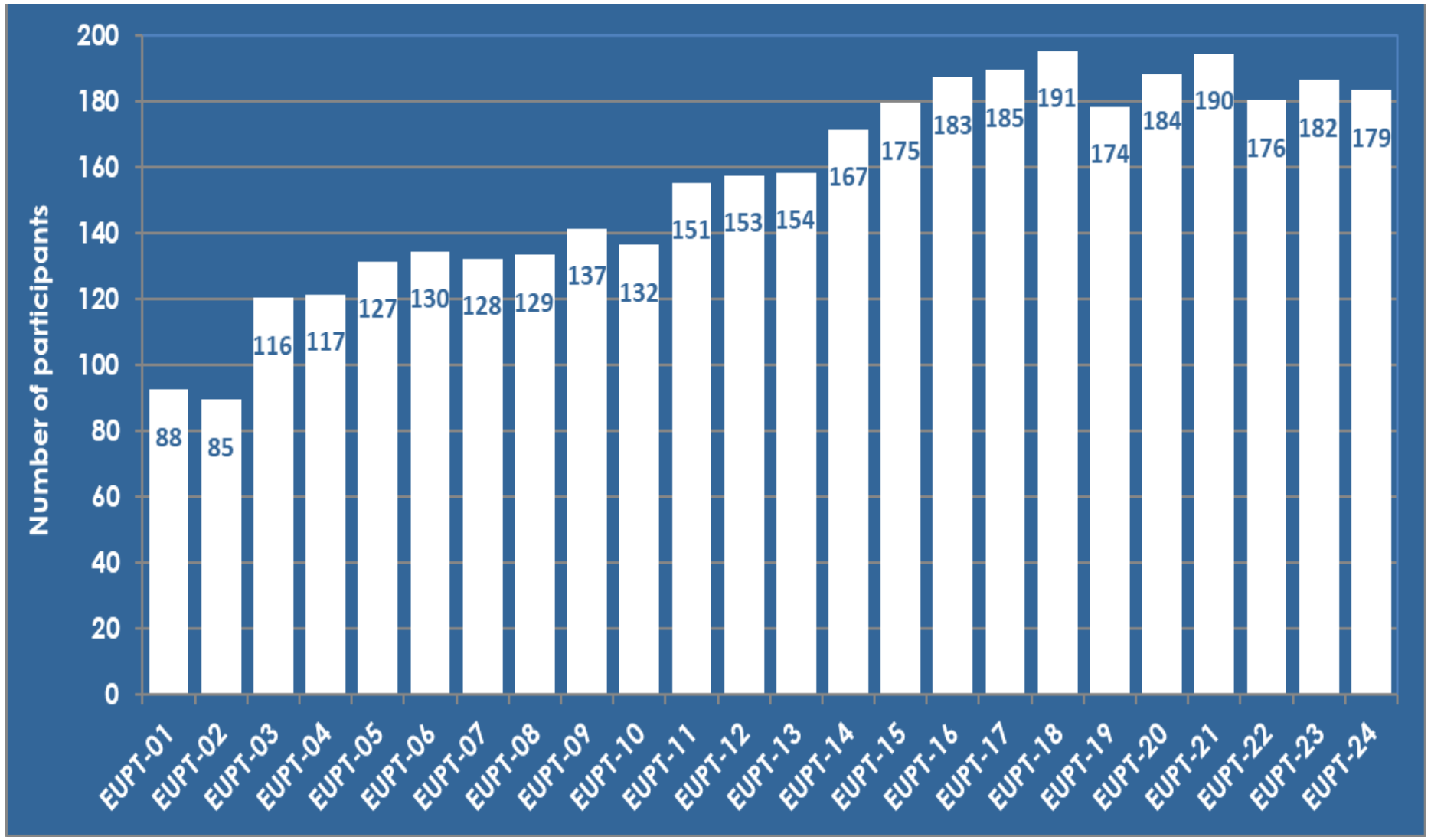
Preliminary Report: (containing preliminary assigned values and z scores)	April 2022
Final Report distributed to the Laboratories.	August 2022

Participation



Participation

Total No. of Labs = 179	Total No. of Countries = 42
EU/EFTA Labs = 157	EU/EFTA countries = 29
Other countries Labs = 22	Other countries = 13

Participation

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Other countries Labs = 22	Other countries = 13

5 participants did not submit results

2 EU/EFTA did not submit results

155 EU/EFTA Labs

Participation

Member State	No. Labs
Austria	1
Belgium	6
Bulgaria	4
Croatia	8
Cyprus	1
Czech Republic	2
Denmark	2
Estonia	2
Finland	3
France	8
Germany	25
Greece	4
Hungary	3
Ireland	1

Member State	No. Labs
Italy	22
Latvia	1
Lithuania	2
Luxembourg	2
Malta	1
Norway	1
Poland	14
Portugal	3
Romania	6
Slovakia	1
Slovenia	1
Spain	31
Sweden	2
Switzerland	3
The Netherlands	2

Non-EU/EFTA	No. Labs
Argentina	1
China	5
Colombia	1
Costa Rica	1
India	1
Kenya	1
Peru	1
Serbia	4
Singapore	1
Thailand	1
Turkey	1
United Kingdom	3
Uruguay	1

Participation

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Latvia	1
Lithuania	2
Luxembourg	2
Malta	1
Norway	1
Poland	14
Portugal	3
Romania	6
Slovakia	1
Slovenia	1
Spain	31
Sweden	2
Switzerland	3
The Netherlands	2

Non-EU/EFTA	No. Labs
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China	5
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Costa Rica	1
India	1
Kenya	1
Peru	1
Serbia	4
Singapore	1
Thailand	1
Turkey	1
United Kingdom	3
Uruguay	1

Results

Assigned values

Spinosad was present in the test item

It could be reported as

Spinosad (sum of spinosyn A and D)

Spinosyn A

Spinosyn D

Assigned values

In 12 cases, labs only reported spinosyn A and spinosyn D

We calculated the sum

Assigned values

Zoxamide

1 outlier was removed for the calculation of the robust mean:

0,58 mg/kg (robust mean 0,046 mg/kg)

Assigned values

Pesticides	Robust Mean X* (mg/kg)
Pymetrozine	0.012
Chlorothalonil	0.020
Fenamiphos sulfoxide	0.021
Spinosyn D	0.029
Isofetamid*	0.045
Zoxamide	0.046
Acetamiprid	0.053
Flupyradifurone*	0.056
Fenamiphos	0.057
Chlorpyrifos	0.072
Buprofezin	0.074
Chlorfenvinphos	0.084
Oxamyl	0.084
Deltamethrin	0.087
Azoxystrobin	0.089
Oxydemeton-methyl	0.098
Flonicamid	0.099
Spinosyn A	0.117
Spinosad	0.139
Procymidone	0.177
Fluopyram	0.457
Propamocarb	0.588
Diazinon	0.616

*Voluntary Pesticides

Assigned values

AV < 3 MRRL

Pesticides	Robust Mean X* (mg/kg)
Pymetrozine	0.012
Chlorothalonil	0.020
Fenamiphos sulfoxide	0.021
Spinosyn D	0.029
Isofetamid*	0.045
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Fluopyram	0.457
Propamocarb	0.588
Diazinon	0.616

*Voluntary Pesticides

Assigned values

AV < 3 MRRL

Presented only for informative purposes

Pesticides	Robust Mean X* (mg/kg)
Pymetrozine	0.012
Chlorothalonil	0.020
Fenamiphos sulfoxide	0.021
Spinosyn D	0.029
Isofetamid*	0.045
Zoxamide	0.046
Acetamiprid	0.053
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Fluopyram	0.457
Propamocarb	0.588
Diazinon	0.616

*Voluntary Pesticides

Assigned values

< 0,1 mg/kg

Pesticides	Robust Mean X* (mg/kg)
Pymetrozine	0.012
Chlorothalonil	0.020
Fenamiphos sulfoxide	0.021
Spinosyn D	0.029
Isofetamid*	0.045
Zoxamide	0.046
Acetamiprid	0.053
Flupyradifurone*	0.056
Fenamiphos	0.057
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Spinosad	0.139
Procymidone	0.177
Fluopyram	0.457
Propamocarb	0.588
Diazinon	0.616

*Voluntary Pesticides

Assigned values

< 0,1 mg/kg

0,1- 0,5 mg/kg

Pesticides	Robust Mean X* (mg/kg)
Pymetrozine	0.012
Chlorothalonil	0.020
Fenamiphos sulfoxide	0.021
Spinosyn D	0.029
Isofetamid*	0.045
Zoxamide	0.046
Acetamiprid	0.053
Flupyradifurone*	0.056
Fenamiphos	0.057
Chlorpyrifos	0.072
Buprofezin	0.074
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Spinosad	0.139
Procymidone	0.177
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Propamocarb	0.588
Diazinon	0.616

*Voluntary Pesticides

Assigned values

< 0,1 mg/kg

0,1- 0,5 mg/kg

> 0,5 mg/kg

Pesticides	Robust Mean X* (mg/kg)
Pymetrozine	0.012
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Spinosyn D	0.029
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*Voluntary Pesticides

	MRRL (mg/kg)	Robust Mean (mg/kg)	CV (%)	Uncertainty (mg/kg)
Acetamiprid	0.01	0.053	13.6	0.001
Azoxystrobin	0.01	0.089	14,1	0.001
Buprofezin	0.01	0.074	15,6	0.001
Chlorfenvinphos	0.01	0.084	16,4	0.001
ⓘ Chlorothalonil	0.01	0.020	27,4	0.001
Chlorpyrifos	0.005	0.072	15,5	0.001
Deltamethrin (cis-deltamethrin)	0.01	0.087	26,0	0.002
Diazinon	0.005	0.616	16,8	0.011
Fenamiphos	0.01	0.057	18,2	0.001
ⓘ Fenamiphos sulfoxide	0,01	0,021	19,1	0,000
Flonicamid	0,01	0,099	14,0	0,002
Fluopyram	0,01	0,475	17,7	0,009
*Flupyradifurone	0.01	0.056	12,7	0.001
*Isofetamid	0.01	0.045	21,5	0.002
Oxamyl	0.01	0.084	15,9	0.001
Oxydemeton-methyl	0.005	0.098	14,7	0.002
Procymidone	0.01	0.177	19,2	0.004
Propamocarb	0.01	0.588	20,0	0.013
ⓘ Pymetrozine	0.01	0.012	20,9	0.000
Spinosad	0.01	0.139	19,2	0.003
ⓘ Spinosyn A	0.01	0.117	23,2	0.004
ⓘ Spinosyn D	0.01	0.029	40,0	0.001
Zoxamide	0.01	0.046	21,9	0.001

ⓘ For informative purposes

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Propamocarb	0.01	0.588	20,0	0.013
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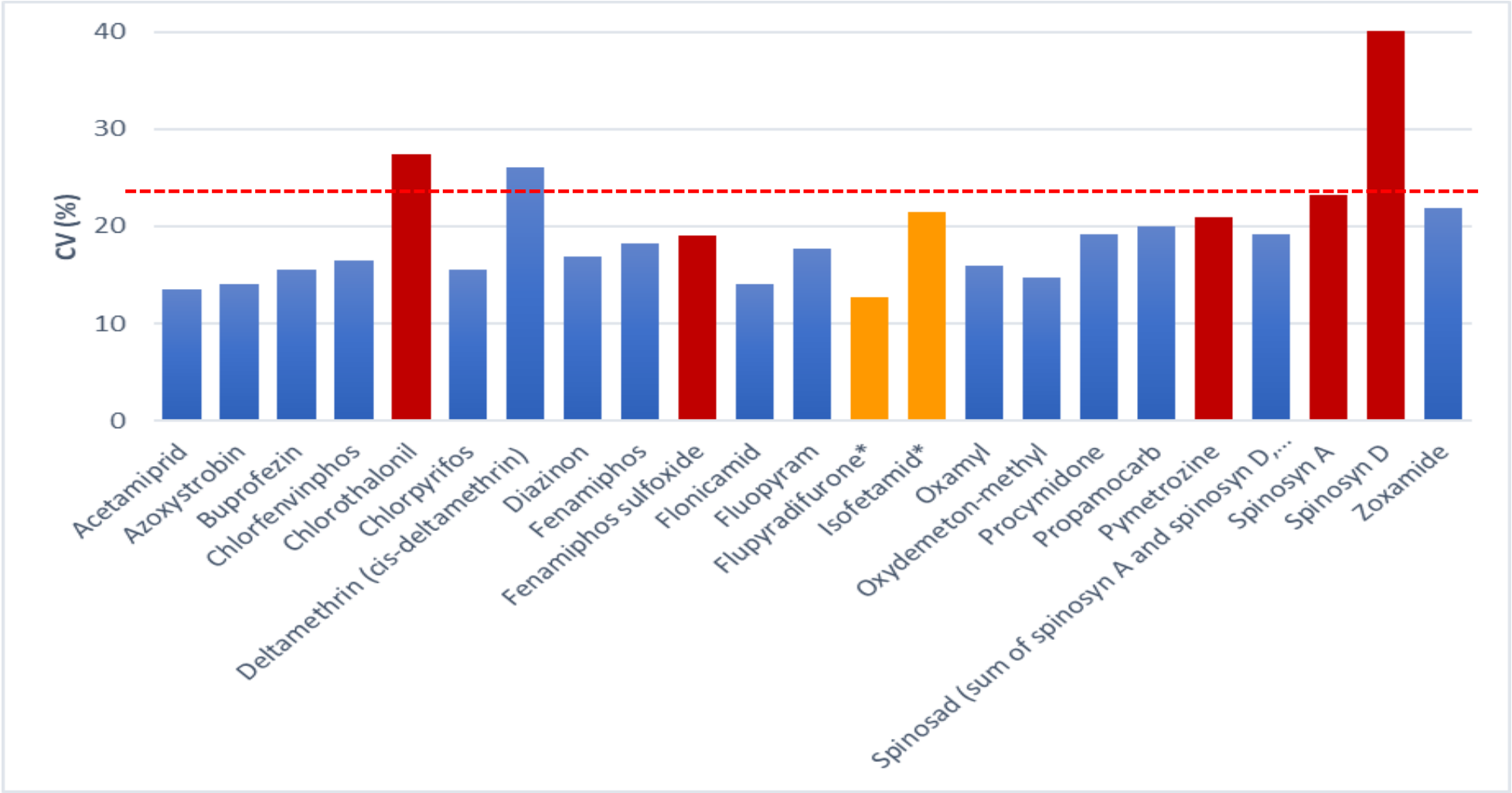
Zoxamide	0.01	0.046	21,9	0.001

Average CV(%): 17,4 %
(excluding informative)

ⓘ For informative purposes

*Voluntary Pesticides

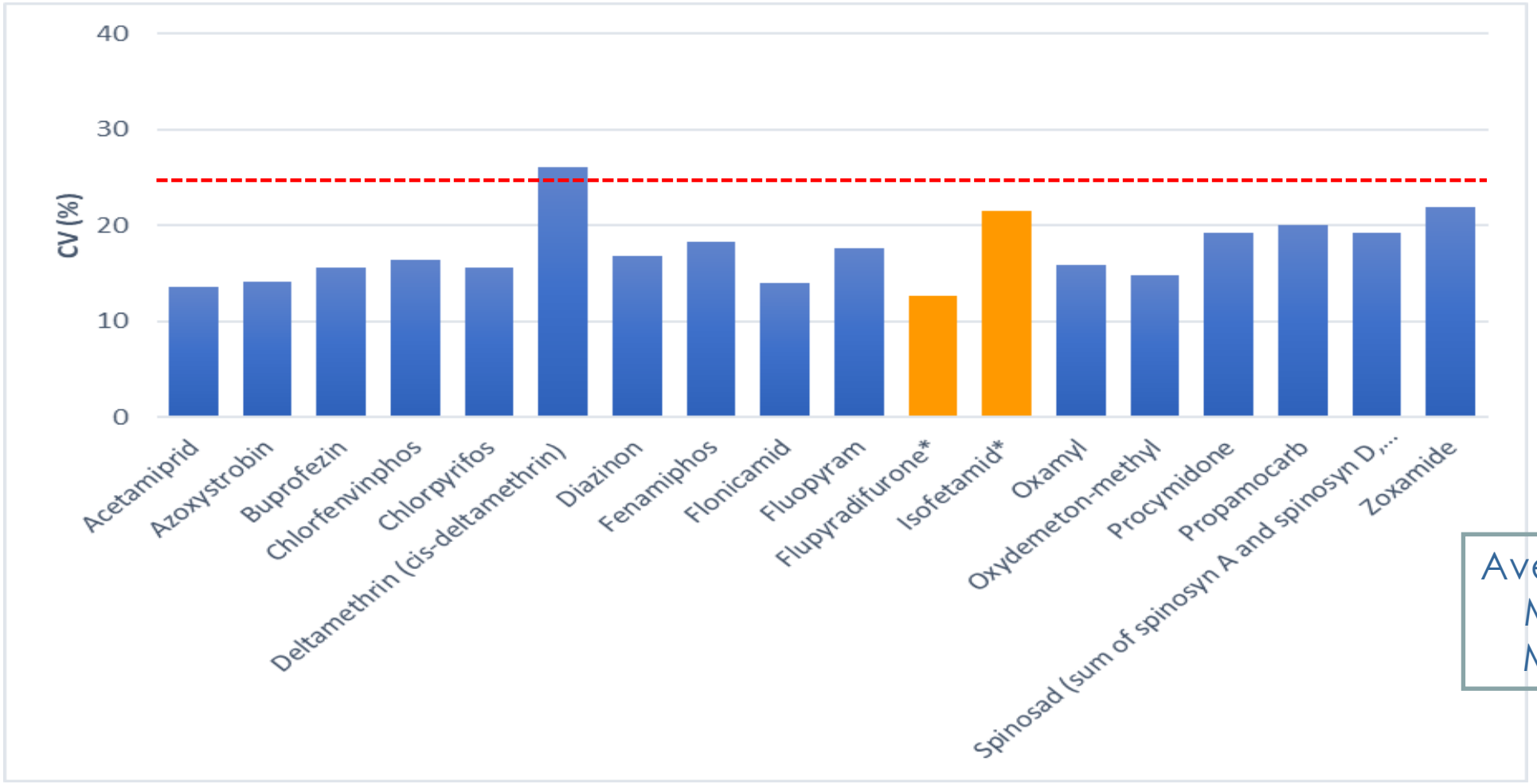
Dispersion of Results



ⓘ For informative purposes

*Voluntary Pesticides

Dispersion of Results

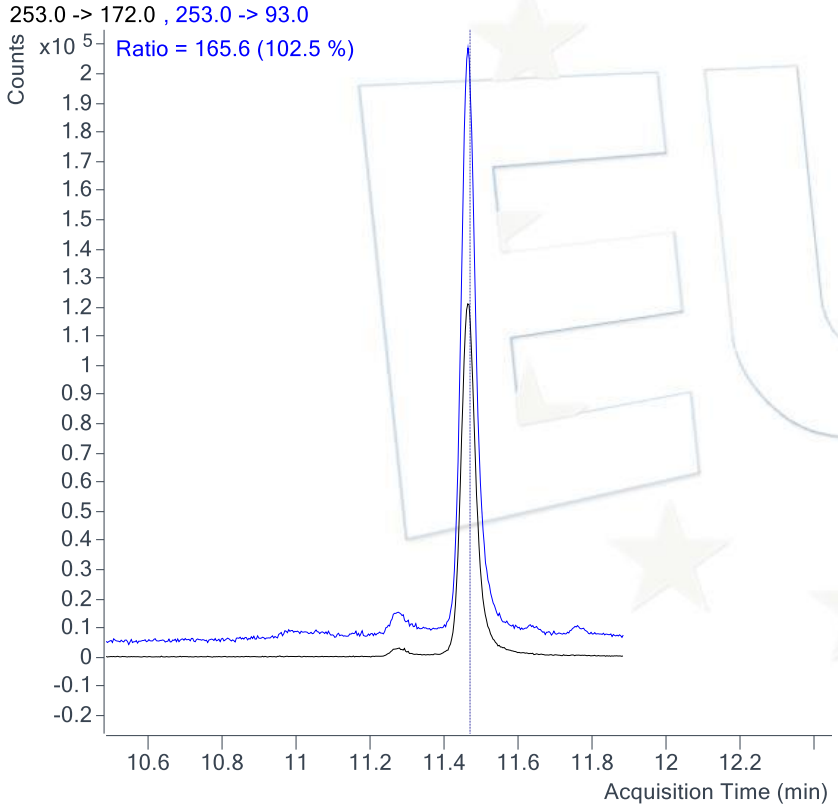


Average 17.4 %
Min. 12.7 %
Max. 26.0%

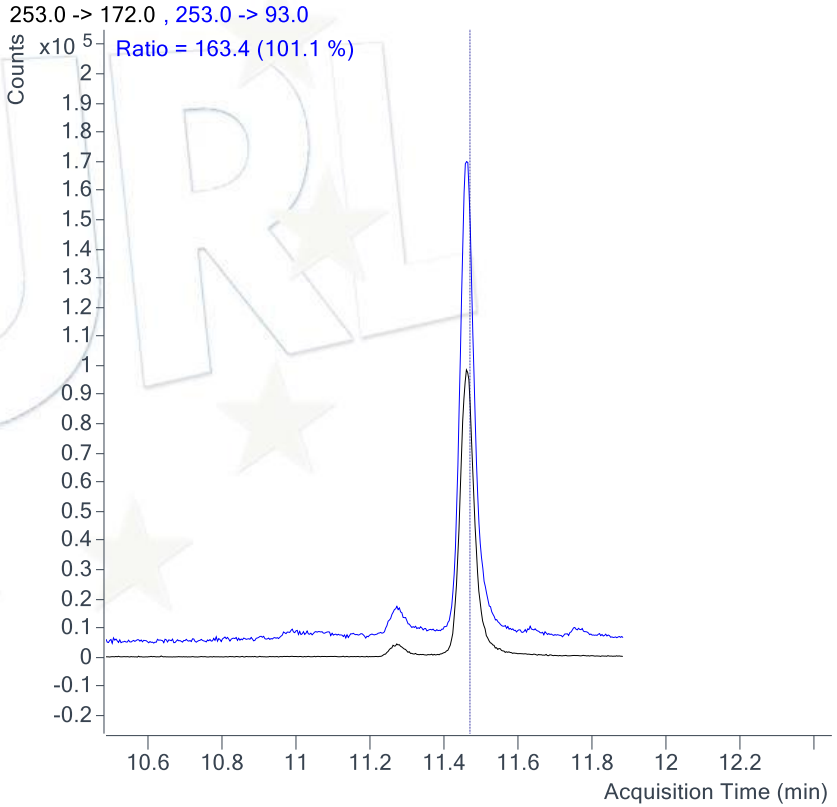
*Voluntary Pesticides

Dispersion of Results
Deltamethrin

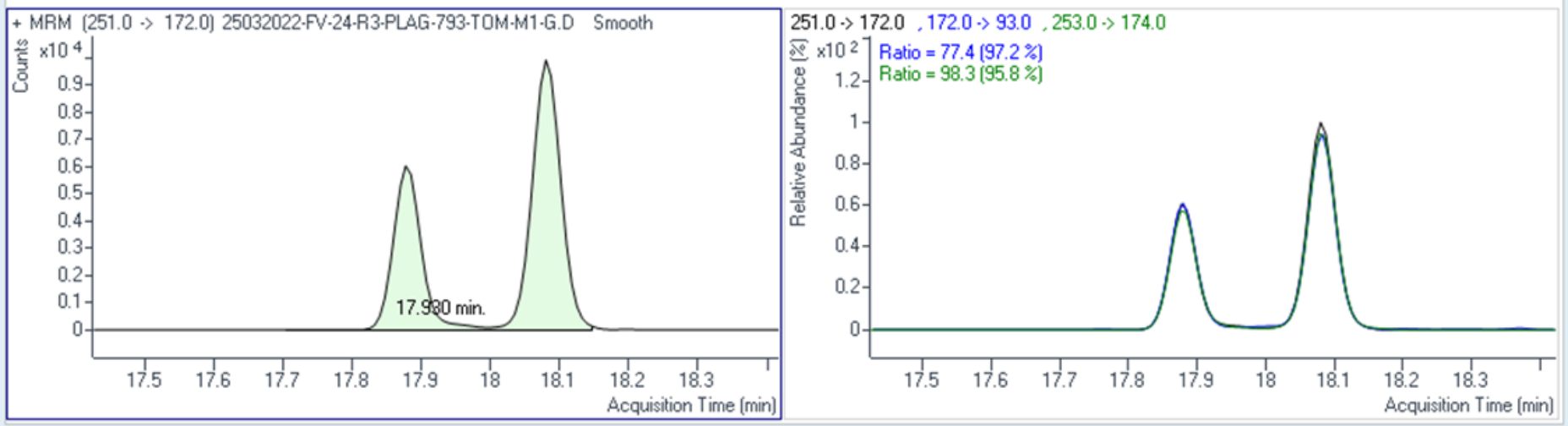
Standard 100 ppb Tomato
EURL-FV



FV24-Tomato
EURL-FV



Dispersion of Results
Deltametrhin



	No. of Reported Results	No. of False Negative Results	No. of Not Analysed Results	Percentage of Labs Reporting Results (out of 155)
Acetamiprid	144	1	10	93
Azoxystrobin	152	1	2	98
Buprofezin	148	1	6	95
Chlorfenvinphos	146	4	5	94
ⓘ Chlorothalonil	107	30 NR	18	69
Chlorpyrifos	153	1	1	99
Deltamethrin (cis-deltamethrin)	144	2	9	93
Diazinon	150	1	4	97
Fenamiphos	146	2	7	94
ⓘ Fenamiphos sulfoxide	126	6 NR	23	81
Flonicamid	132	5	18	85
Fluopyram	140	3	12	90
*Flupyradifurone	59	3	93	38
*Isofetamid	61	4	90	39
Oxamyl	137	1	17	88
Oxydemeton-methyl	128	6	21	83
Procymidone	142	5	8	92
Propamocarb	136	2	17	88
ⓘ Pymetrozine	94	39 NR	22	61
Spinosad	141	0	14	91
ⓘ Spinosyn A	92		14	59
ⓘ Spinosyn D	92		14	59
Zoxamide	138	2	15	89

ⓘ For informative purposes

*Voluntary Pesticides

	No. of Reported Results	No. of False Negative Results	No. of Not Analysed Results	Percentage of Labs Reporting Results (out of 155)
Acetamiprid	144	1	10	93
Azoxystrobin	152	1	2	98
Buprofezin	148	1	6	95
Chlorfenvinphos	146	4	5	94
ⓘ Chlorothalonil	107	30 NR	18	69
Chlorpyrifos	153	1	1	99
Deltamethrin (cis-deltamethrin)	144	2	9	93
Diazinon	150	1	4	97
Fenamiphos	146	2	7	94
ⓘ Fenamiphos sulfoxide	126	6 NR	23	81
Flonicamid	132	5	18	85
Fluopyram	140	3	12	90
*Flupyradifurone	59	3	93	38
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ⓘ Spinosyn A	92		14	59
ⓘ Spinosyn D	92		14	59
Zoxamide	138	2	15	89

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Azoxystrobin	152	1	2	98
Buprofezin	148	1	6	95
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Fluopyram	140	3	12	90
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Spinosad	141	0	14	91
ⓘ Spinosyn A	92		14	59
ⓘ Spinosyn D	92		14	59
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ⓘ Spinosyn D	92		14	59
Zoxamide	138	2	15	89

ⓘ For informative purposes

*Voluntary Pesticides

False Negatives

19 EU/EFTA laboratories reported **37 false negatives** of mandatory pesticides

Laboratory	Acetamiprid	Azoxystrobin	Buprofezin	Chlorfenvinphos	Chlorpyrifos	Deltamethrin (cis-deltamethrin)	Diazinon	Fenamiphos	Flonicamid	Fluopyram	Oxamyl	Oxydemeton-methyl	Procymidone	Propamocarb	Zoxamide
6				■											
20									■					■	
22												■			
27												■			
40				■											
44						■							■		
45									■						
46										■					
82				■											■
84												■	■		
111														■	
132												■			
150	■										■				
166									■						
167													■		
169		■	■	■	■	■	■	■	■	■		■	■		■
179									■						
182												■			
187								■		■			■		

False Positives

8 EU/EFTA laboratories reported **6 mandatory** pesticides as false positives

Lab Code	Pesticide	Reporting level (mg/kg)	Concentration (mg/kg)	Determination technique
162	Aldrin	0.01	0.073	GC-MS/MS (QQQ)
61	Carbofuran	0.01	0.233	LC-MS/MS QQQ
84	Demeton-S-methylsulfone	0.01	0.075	LC-Q-TOF
132	Demeton-S-methylsulfone	0.005	0.105	LC-MS/MS QQQ
182	Demeton-S-methylsulfone	0.005	0.099	LC-MS/MS QQQ
100	Spinetoram	0.01	0.025	LC-MS/MS QQQ
181	Thiabendazole	0.01	0.010	LC-MS/MS QQQ
124	Triflumizole	0.01	0.024	GC-MS/MS (QQQ)

False Positives

3 non-EU/EFTA laboratory reported **4** **mandatory** pesticides as false positives

Lab Code	Pesticide	Reporting level (mg/kg)	Concentration (mg/kg)	Determination technique
161	Famoxadone	0.01	0.02	GC-MS/MS (QQQ)
123	Fenpropathrin	0.01	0.17	LC-MS/MS QQQ
163	Spinetoram	0.01	0.105	LC-MS/MS QQQ
123	Tricyclazole	0.01	0.01	GC-MS/MS (QQQ)

z-Scores

Z Scores classification

	Robust Mean (mg/kg)	% Acceptable z scores	% Questionable z scores	% Unacceptable z scores
Acetamiprid	0,053	97,9	0,7	1,4
Azoxystrobin	0,089	95,4	3,3	1,3
Buprofezin	0,074	98,7	0,0	1,3
Chlorfenvinphos	0,084	94,7	2,0	3,3
ⓘ Chlorothalonil	0,020	89,7	5,6	4,7
Chlorpyrifos	0,072	97,4	1,3	1,3
Deltamethrin	0,087	89,0	6,2	4,8
Diazinon	0,616	97,4	1,3	1,3
Fenamiphos	0,057	94,6	1,4	4,1
ⓘ Fenamiphos sulfoxide	0,021	96,0	1,6	2,4
Flonicamid	0,099	92,7	2,2	5,1
Fluopyram	0,457	93,7	2,8	3,5
*Flupyradifurone	0,056	93,5	1,6	4,8
*Isofetamid	0,045	92,3	1,5	6,2
Oxamyl	0,084	94,9	2,2	2,9
Oxydemeton-methyl	0,098	92,5	0,0	7,5
Procymidone	0,177	93,2	2,7	4,1
Propamocarb	0,588	90,6	3,6	5,8
ⓘ Pymetrozine	0,012	96,8	2,1	1,1
Spinosad	0,139	95,0	2,1	2,8
ⓘ Spinosyn A	0,117	94,6	3,3	2,2
ⓘ Spinosyn D	0,029	79,3	4,3	16,3
Zoxamide	0,046	91,4	2,9	5,7

ⓘ For informative purposes

*Voluntary Pesticides

Z Scores classification

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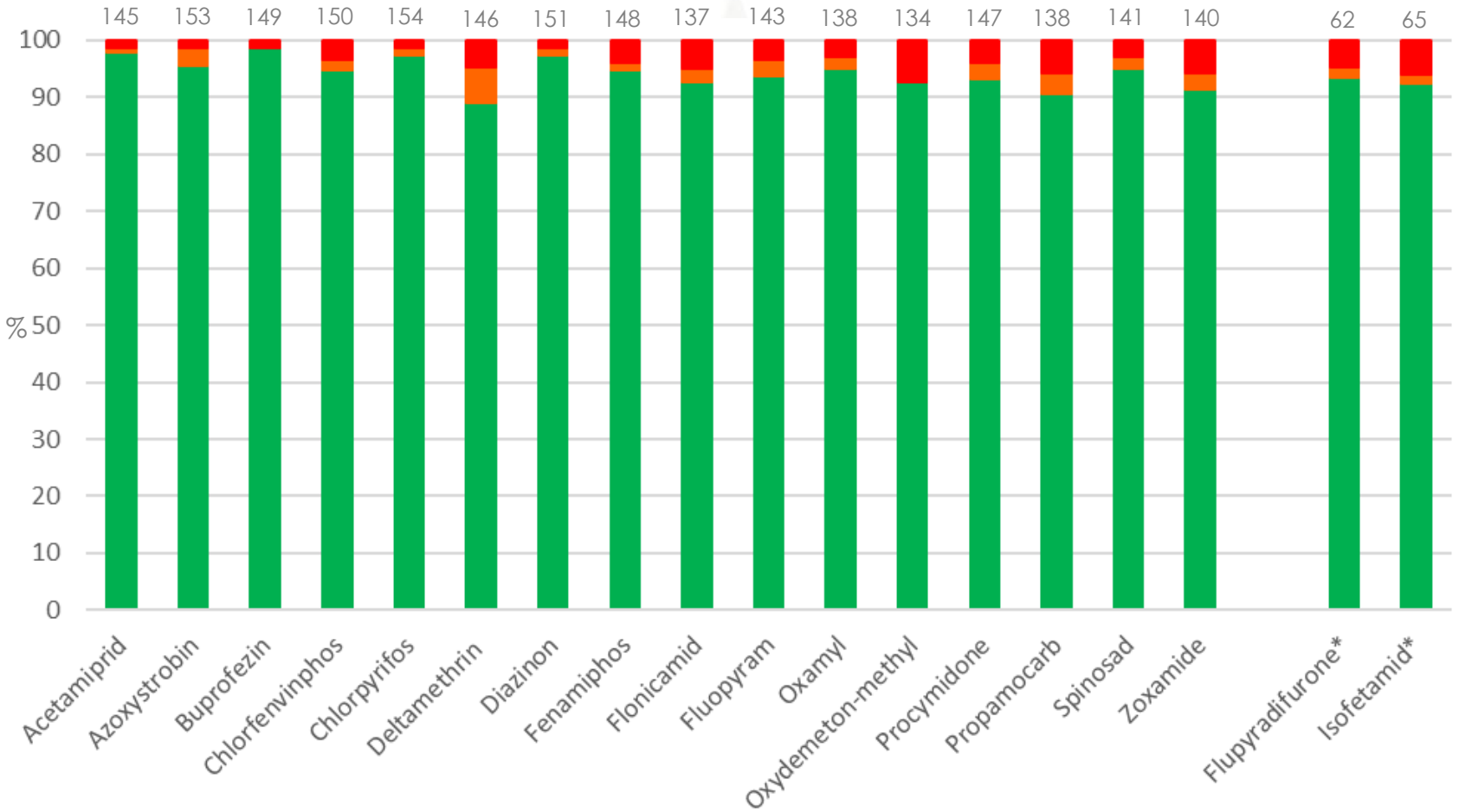
ⓘ For informative purposes

*Voluntary Pesticides

Z Scores classification

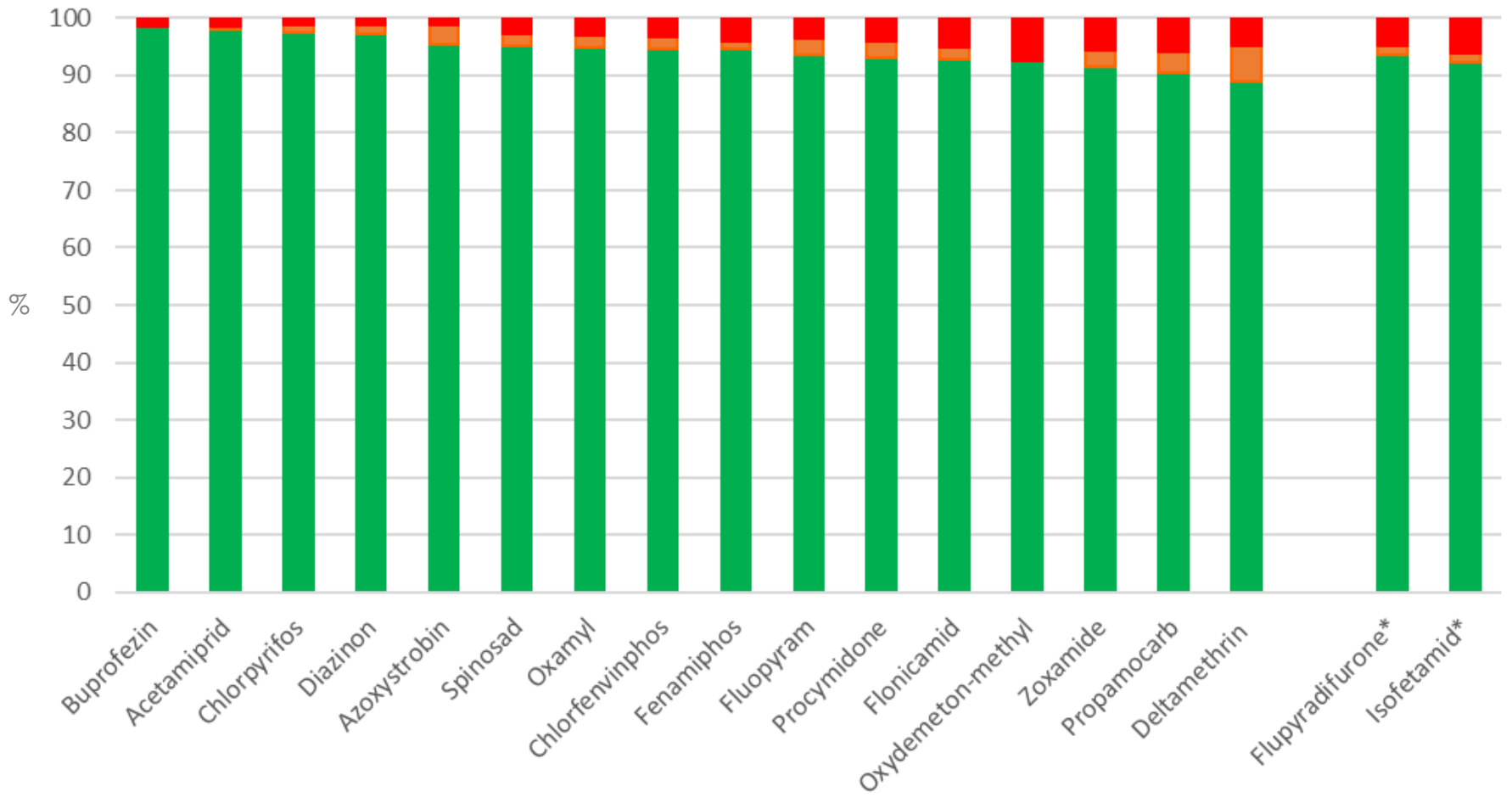
EU/EFTA Laboratories



Acceptable **Questionable** **Unacceptable**

Z Scores classification

EU/EFTA Laboratories

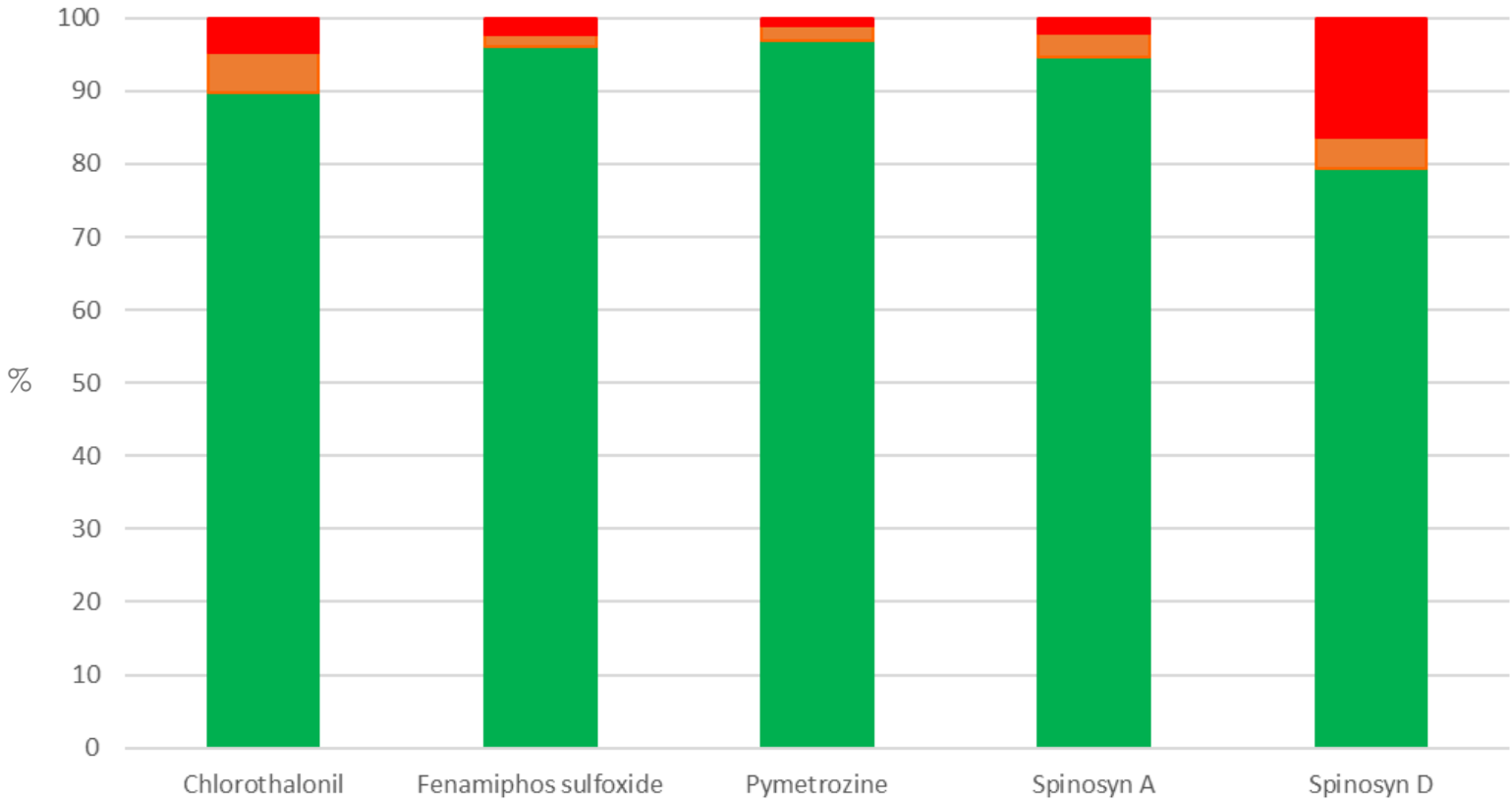


Acceptable **Questionable** **Unacceptable**

Z Scores classification

Informative compounds

EU/EFTA Laboratories



Acceptable **Questionable** **Unacceptable**

High results

Overall, 14 laboratories had

29 z scores ≥ 5.0

High results

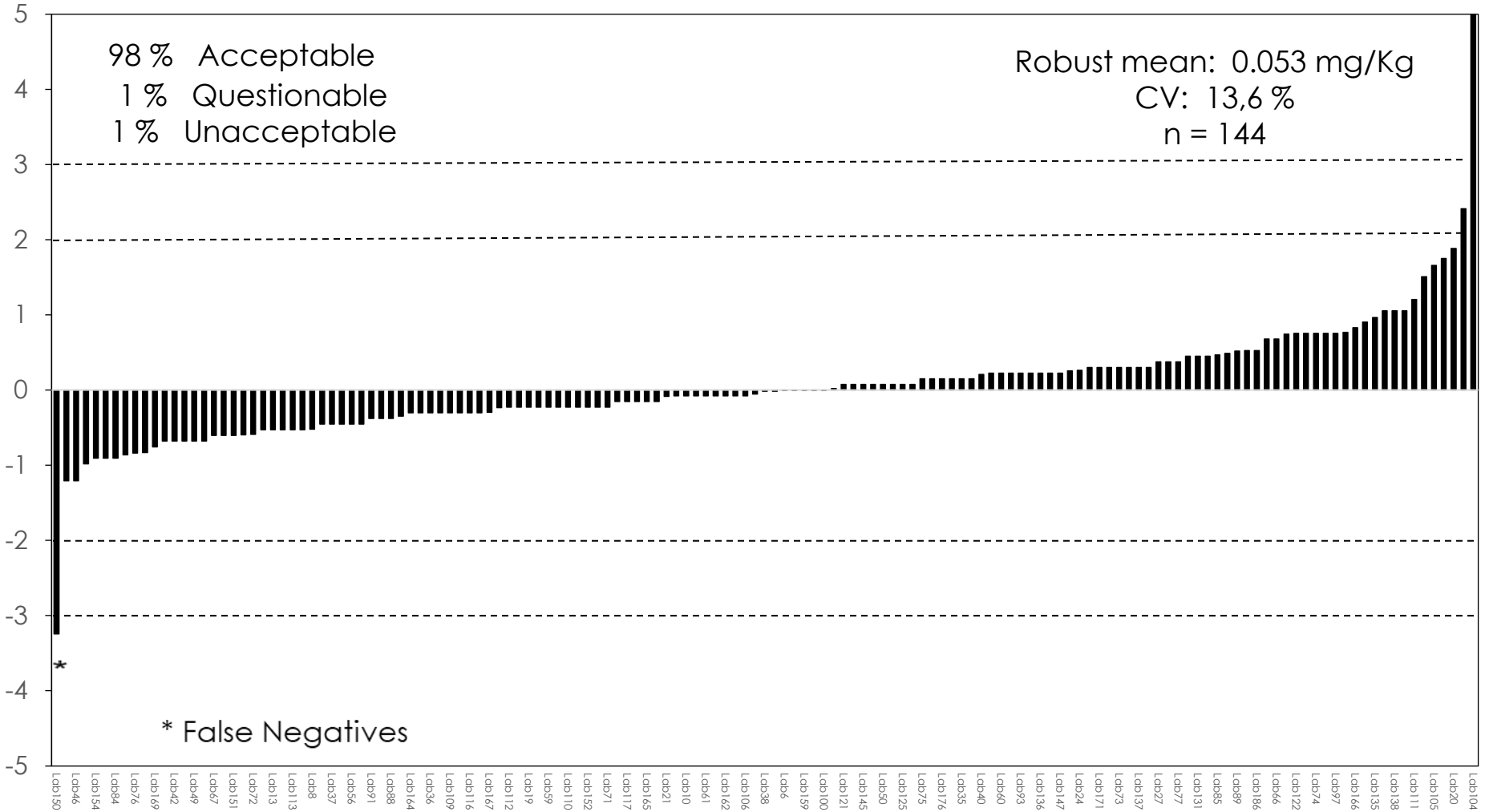
11 EU/EFTA laboratories had **14** z scores ≥ 5.0

Laboratory	Acetamiprid	Azoxystrobin	Fenamiphos	Oxamyl	Oxydemeton-methyl	Procymidone	Propamocarb	Spinosad	Zoxamide
20		■							■
57									■
60									■
74				■					
97					■	■			
104	■			■					
111								■	
124							■		
125								■	
166								■	
179			■						

EU/EFTA Laboratories

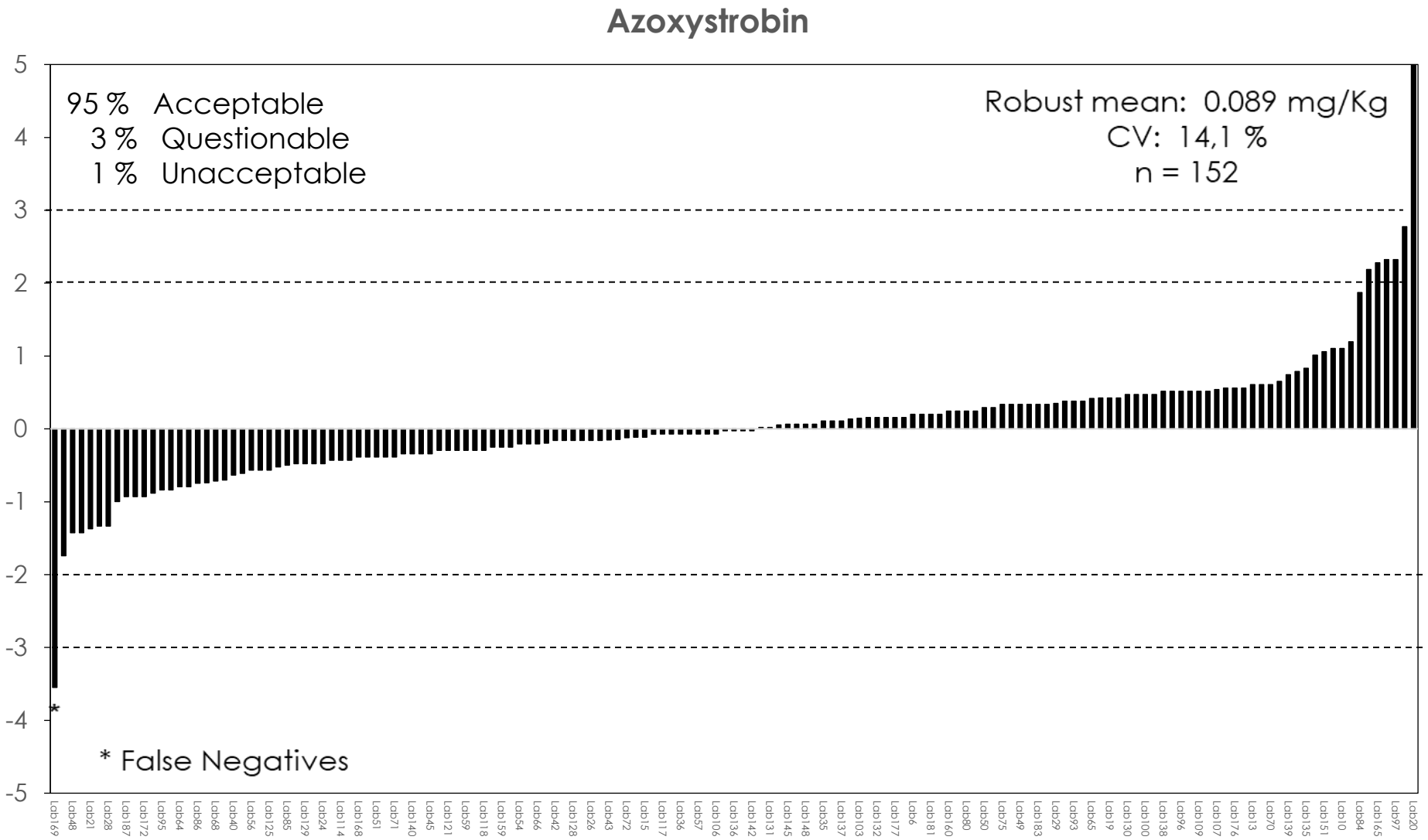
Incurred

Acetamiprid



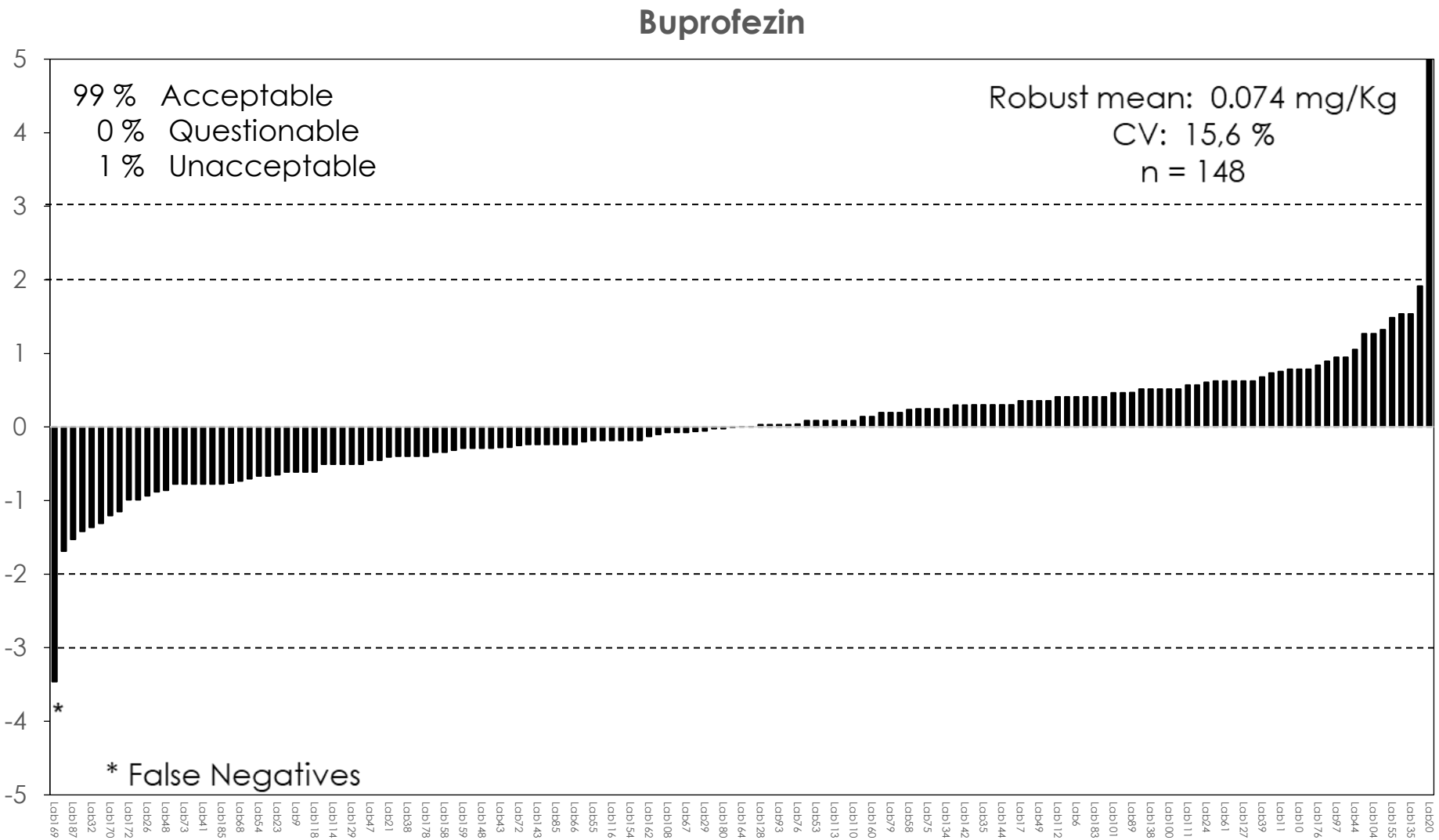
EU/EFTA Laboratories

Incurred



EU/EFTA Laboratories

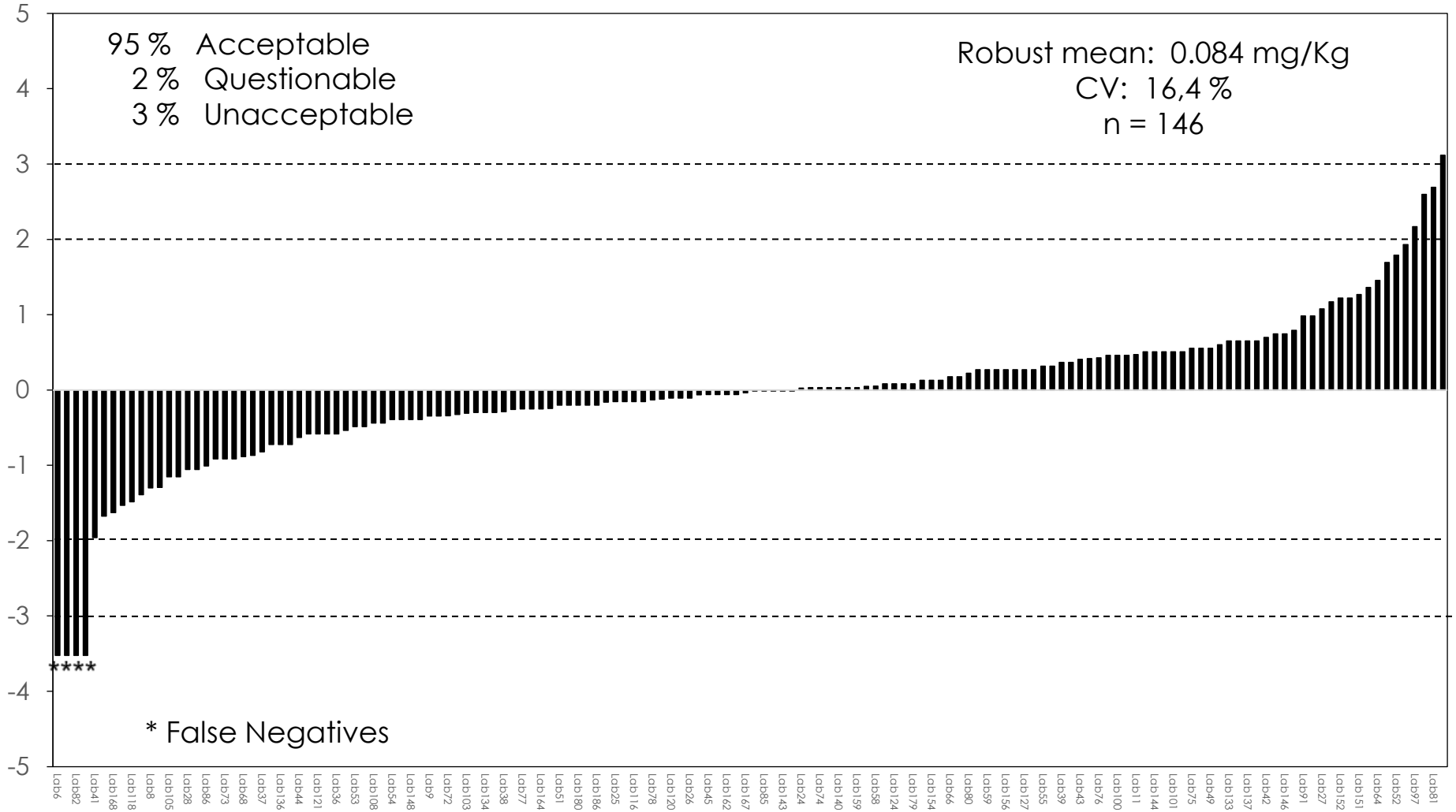
Incurred



EU/EFTA Laboratories

Spiked

Chlorfenvinphos

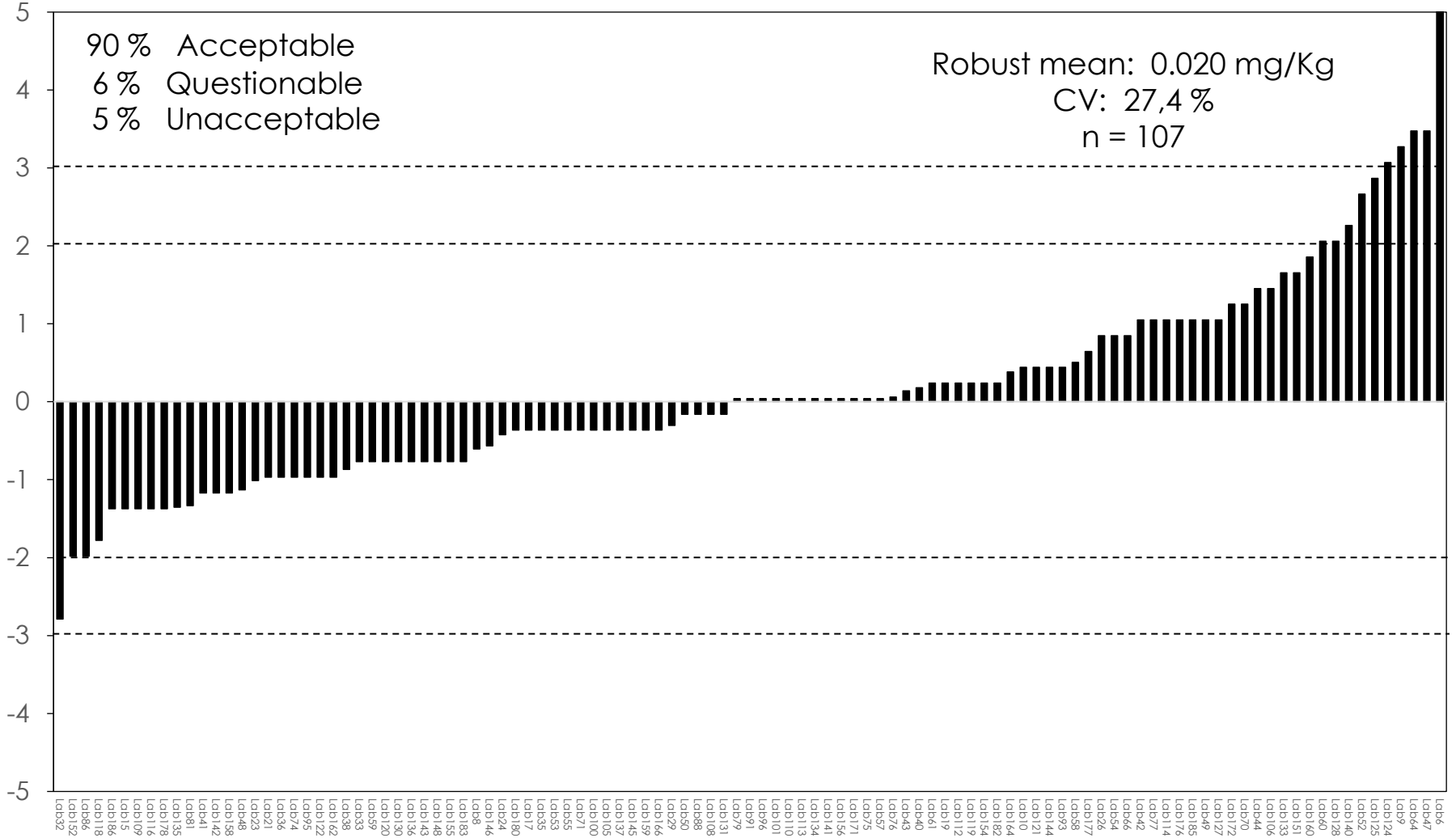


EU/EFTA Laboratories

Incurred

False negatives are not assesed
For informative purposes

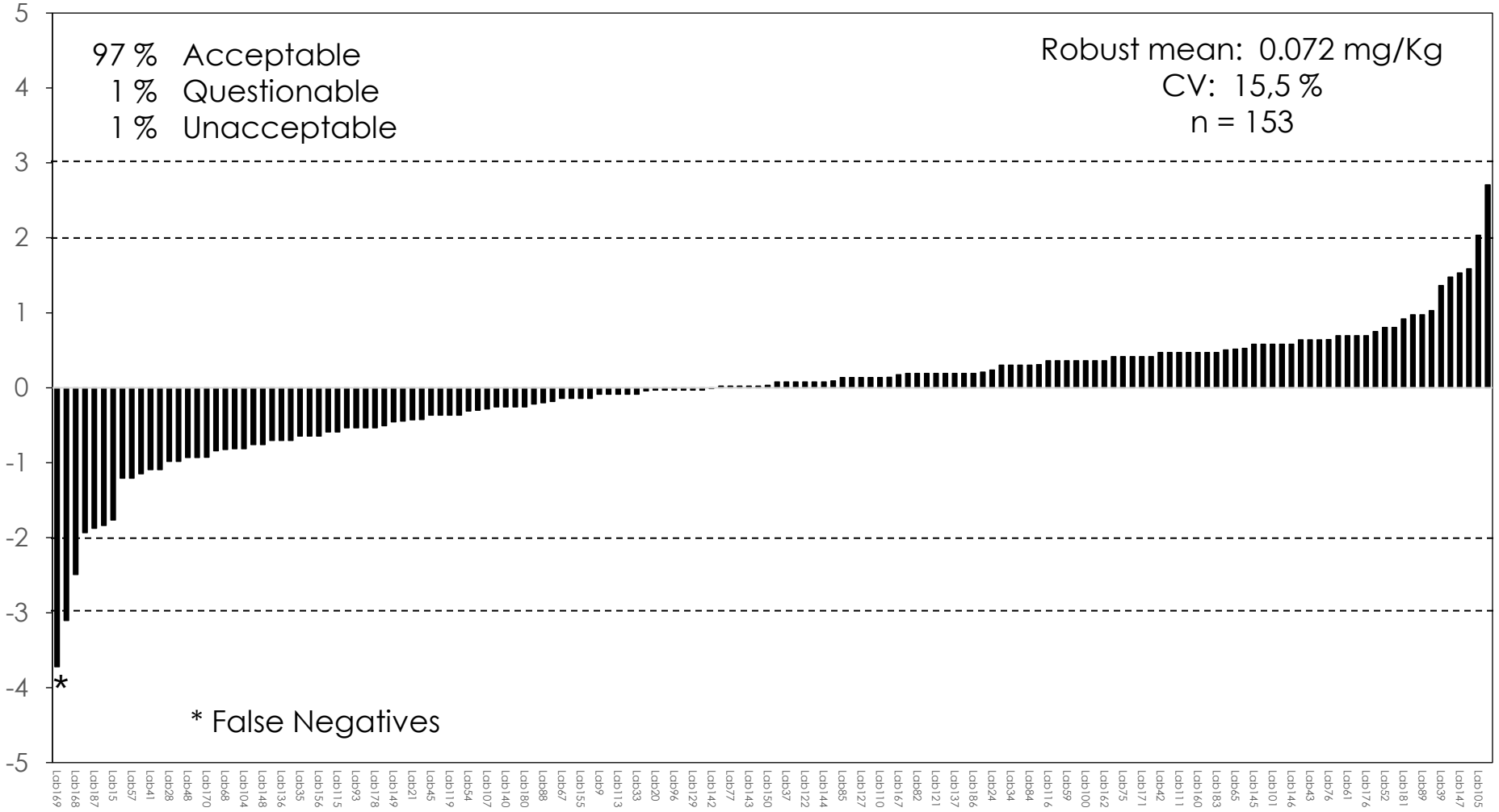
Chlorothalonil



EU/EFTA Laboratories

Spiked

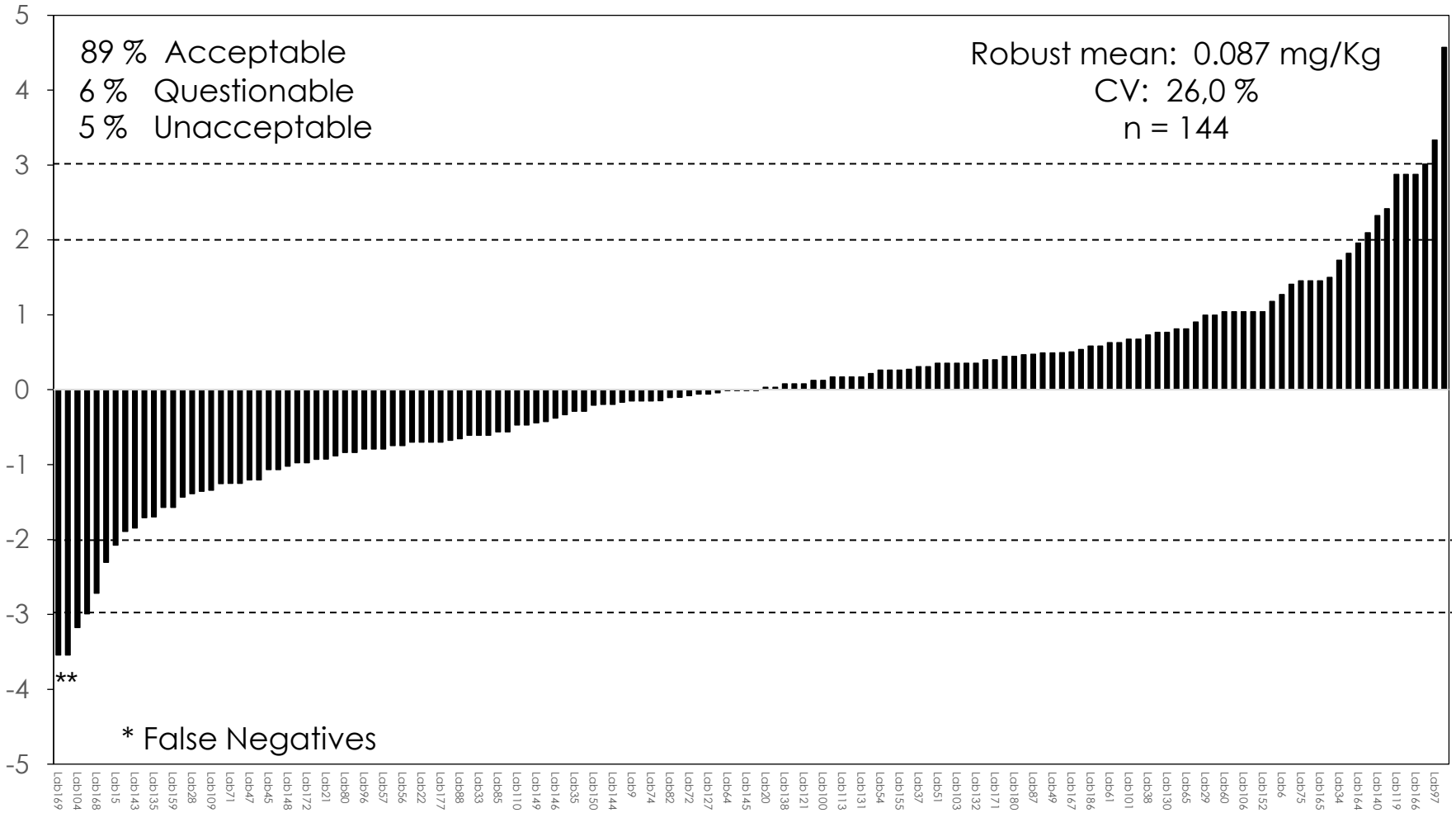
Chlorpyrifos



EU/EFTA Laboratories

Spiked

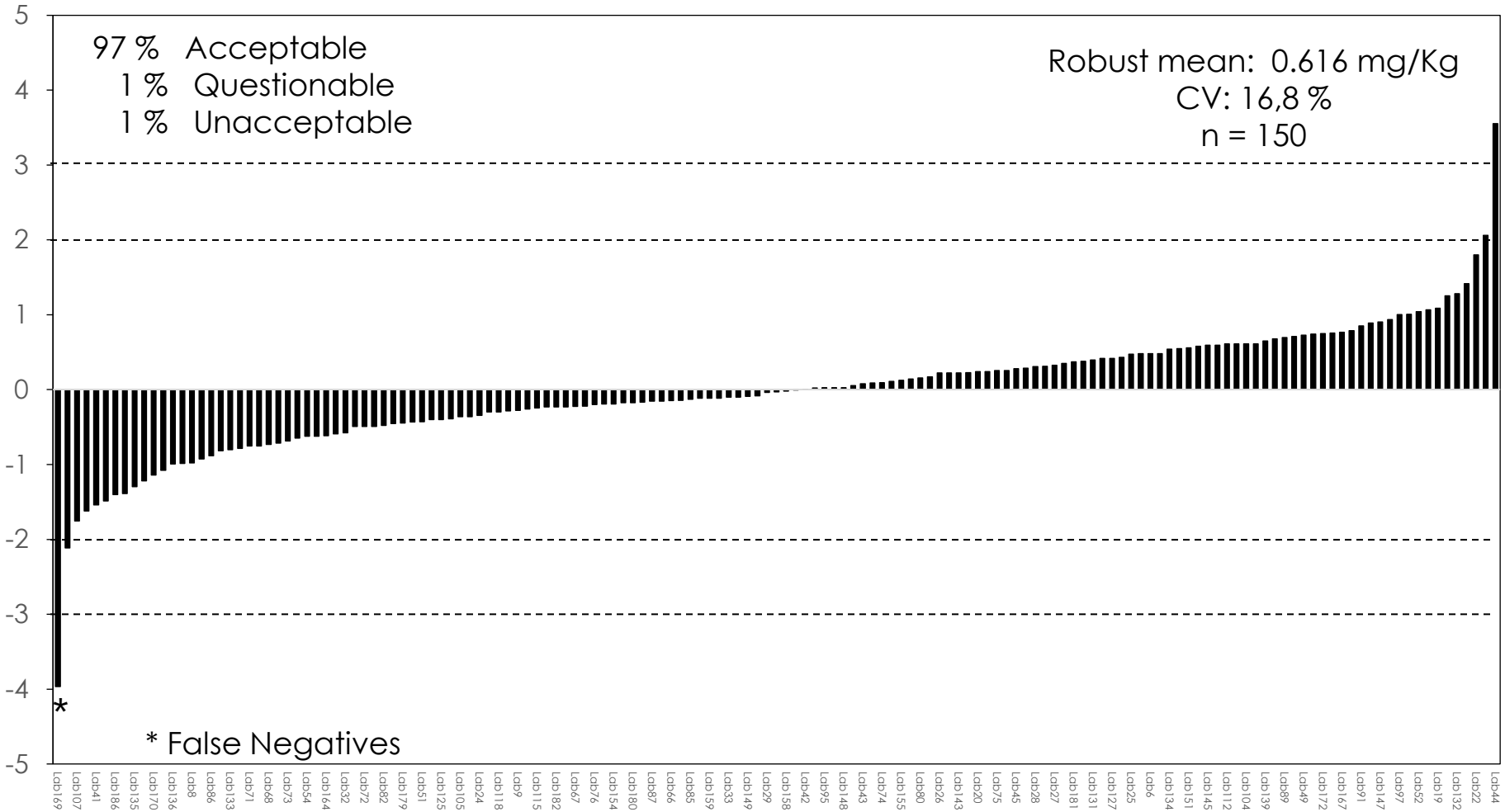
Deltamethrin (cis-deltamethrin)



EU/EFTA Laboratories

Spiked

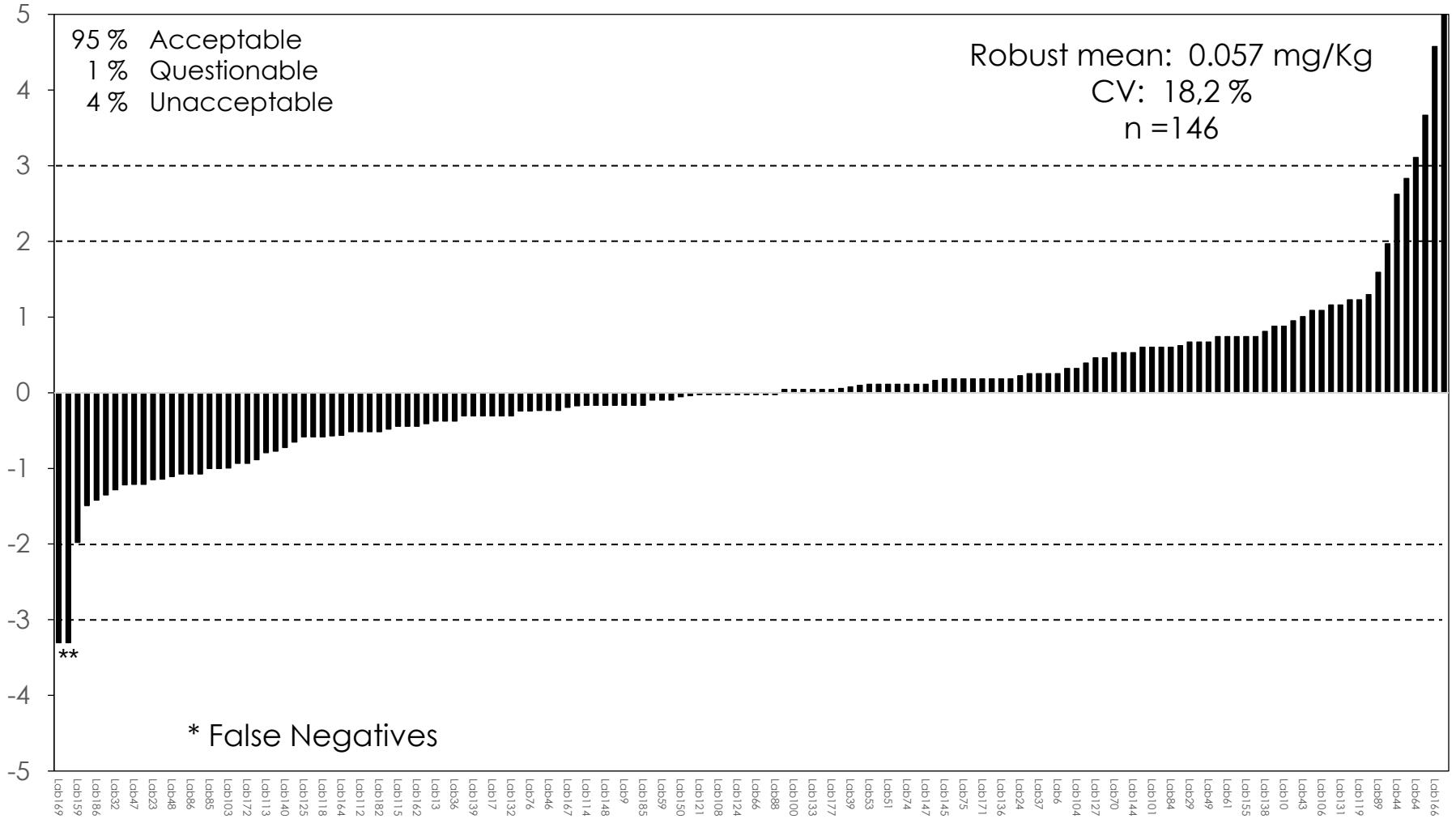
Diazinon



EU/EFTA Laboratories

Incurred

Fenamiphos

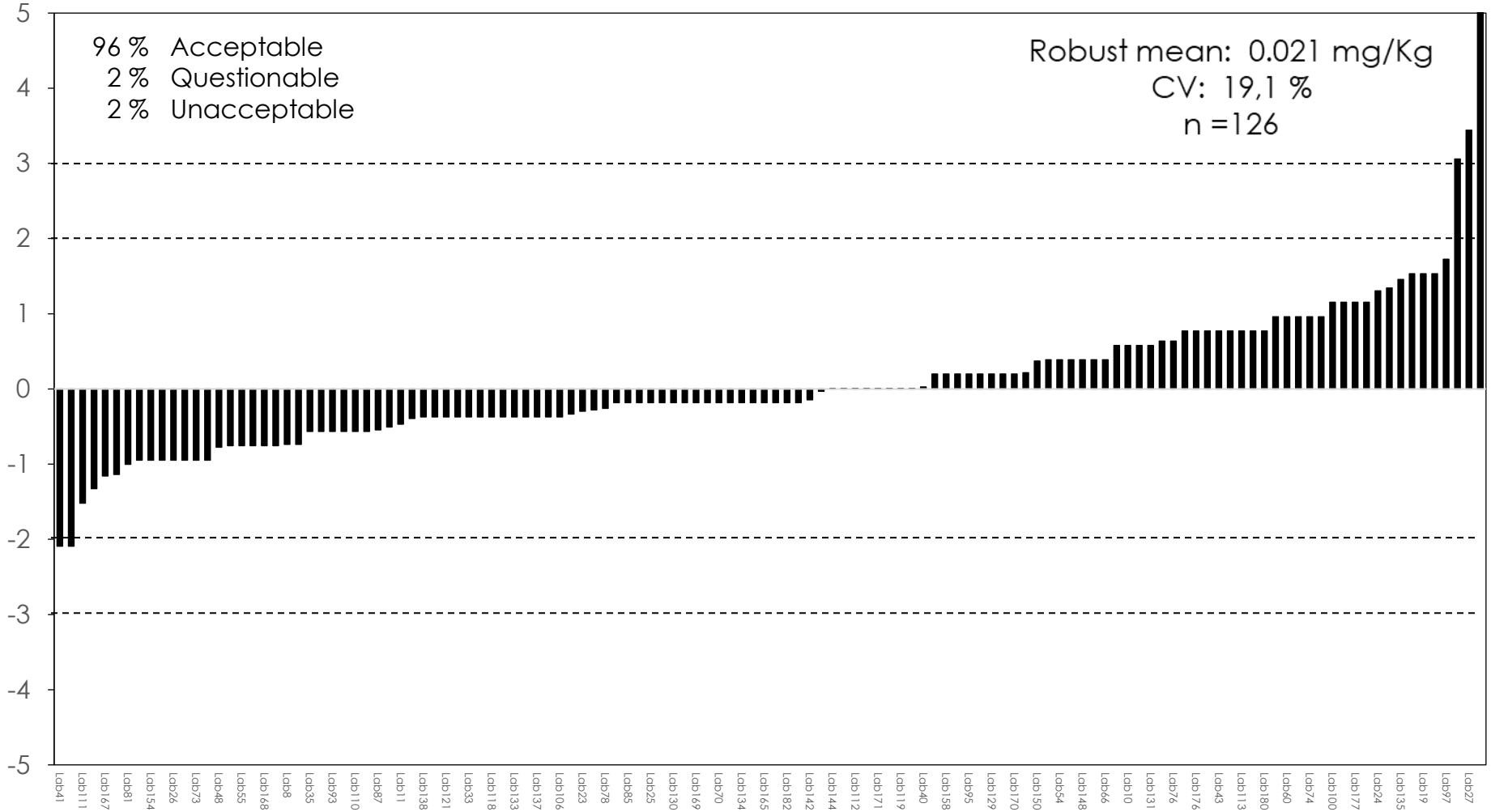


EU/EFTA Laboratories

Incurred

False negatives are not assesed
For informative purposes

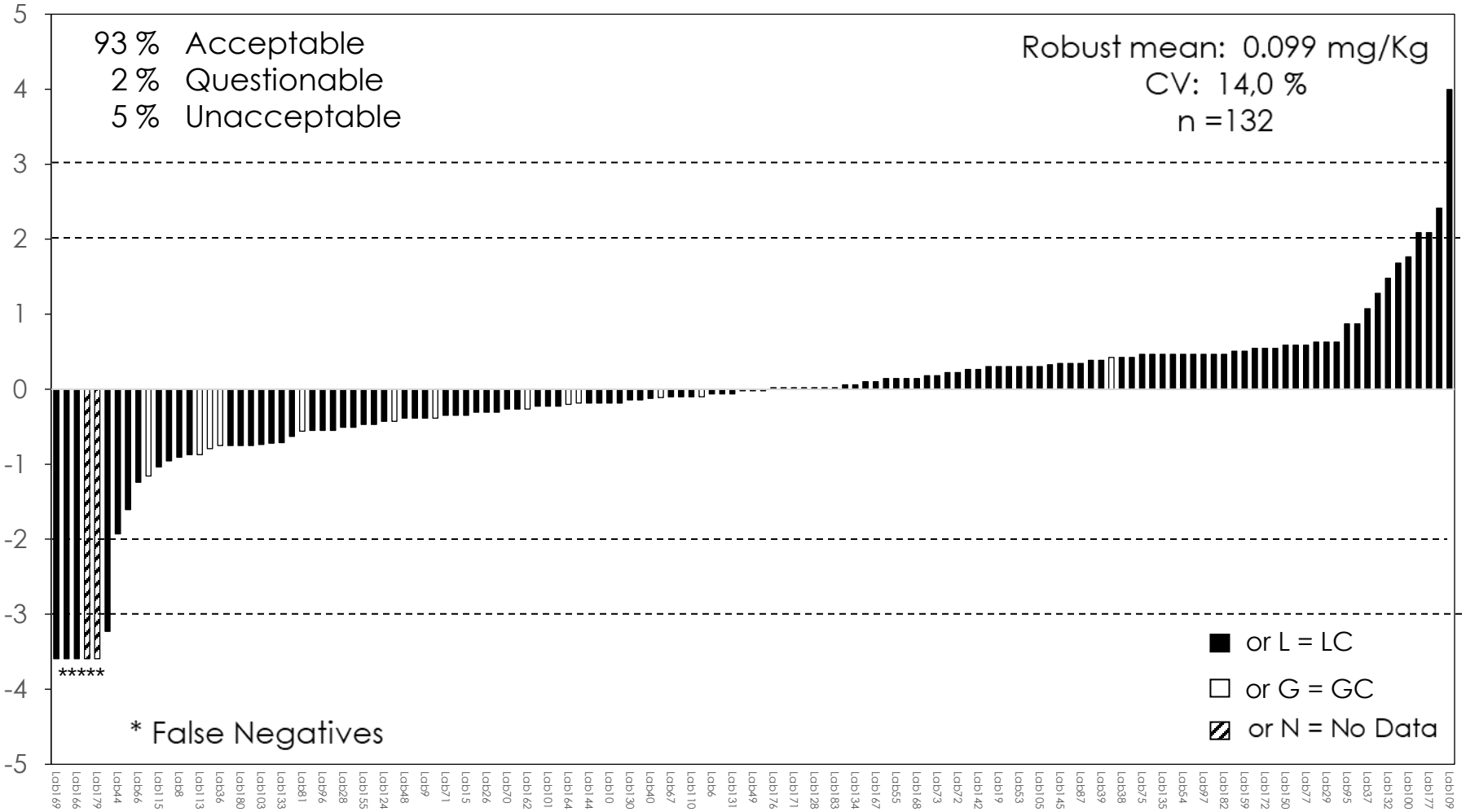
Fenamiphos sulfoxide



EU/EFTA Laboratories

Incurred

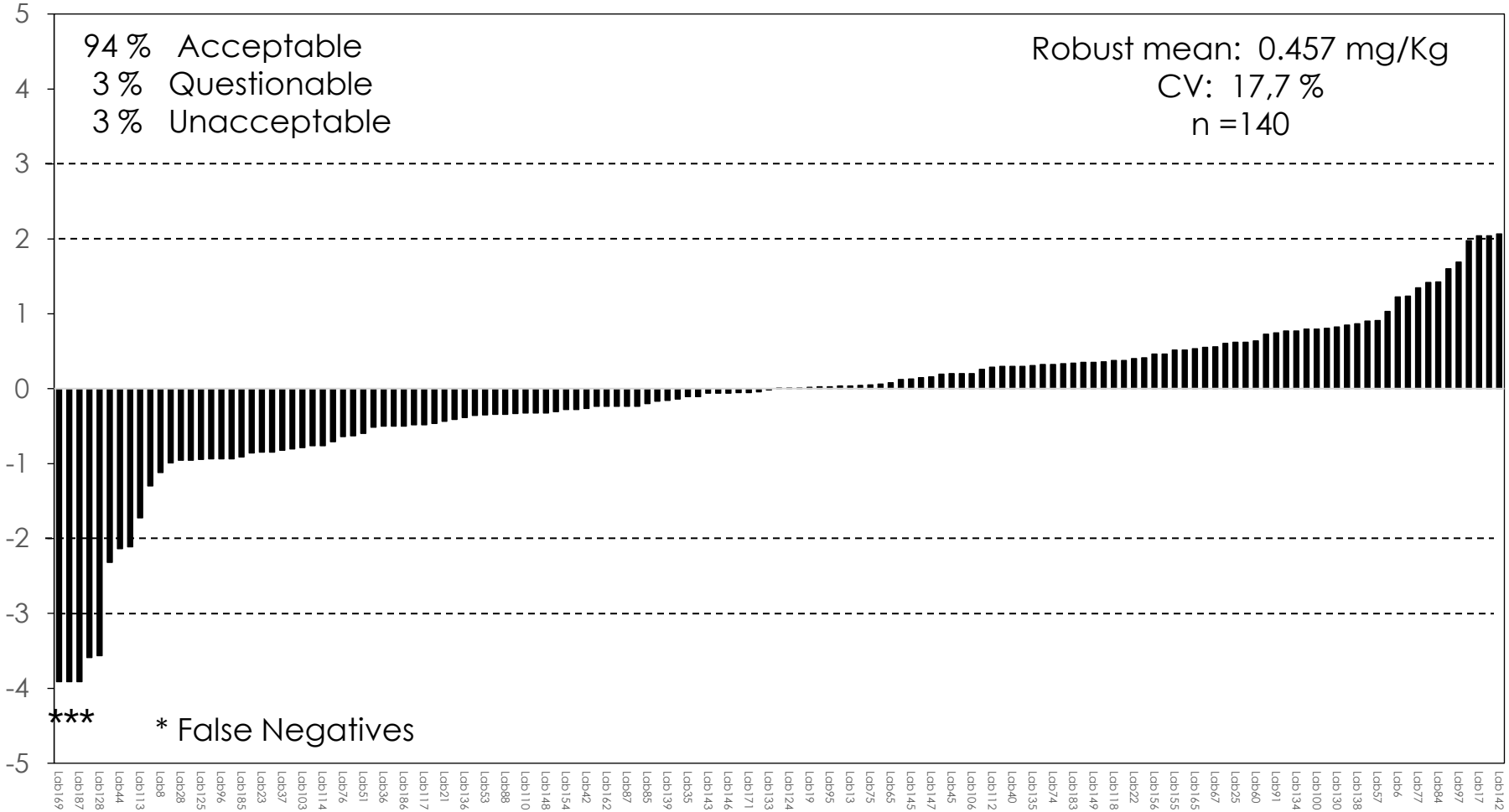
Flonicamid



EU/EFTA Laboratories

Spiked

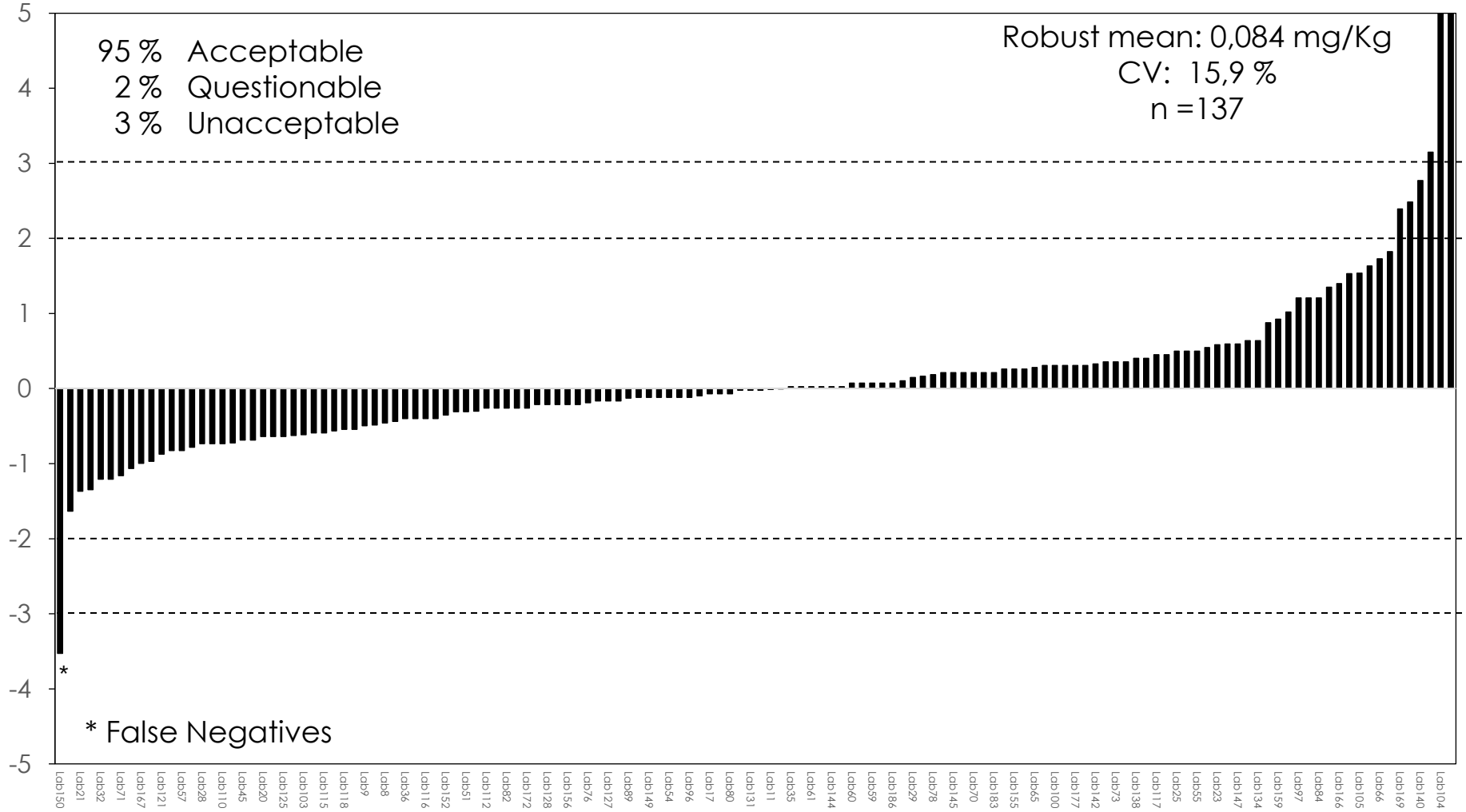
Fluopyram



EU/EFTA Laboratories

Incurred

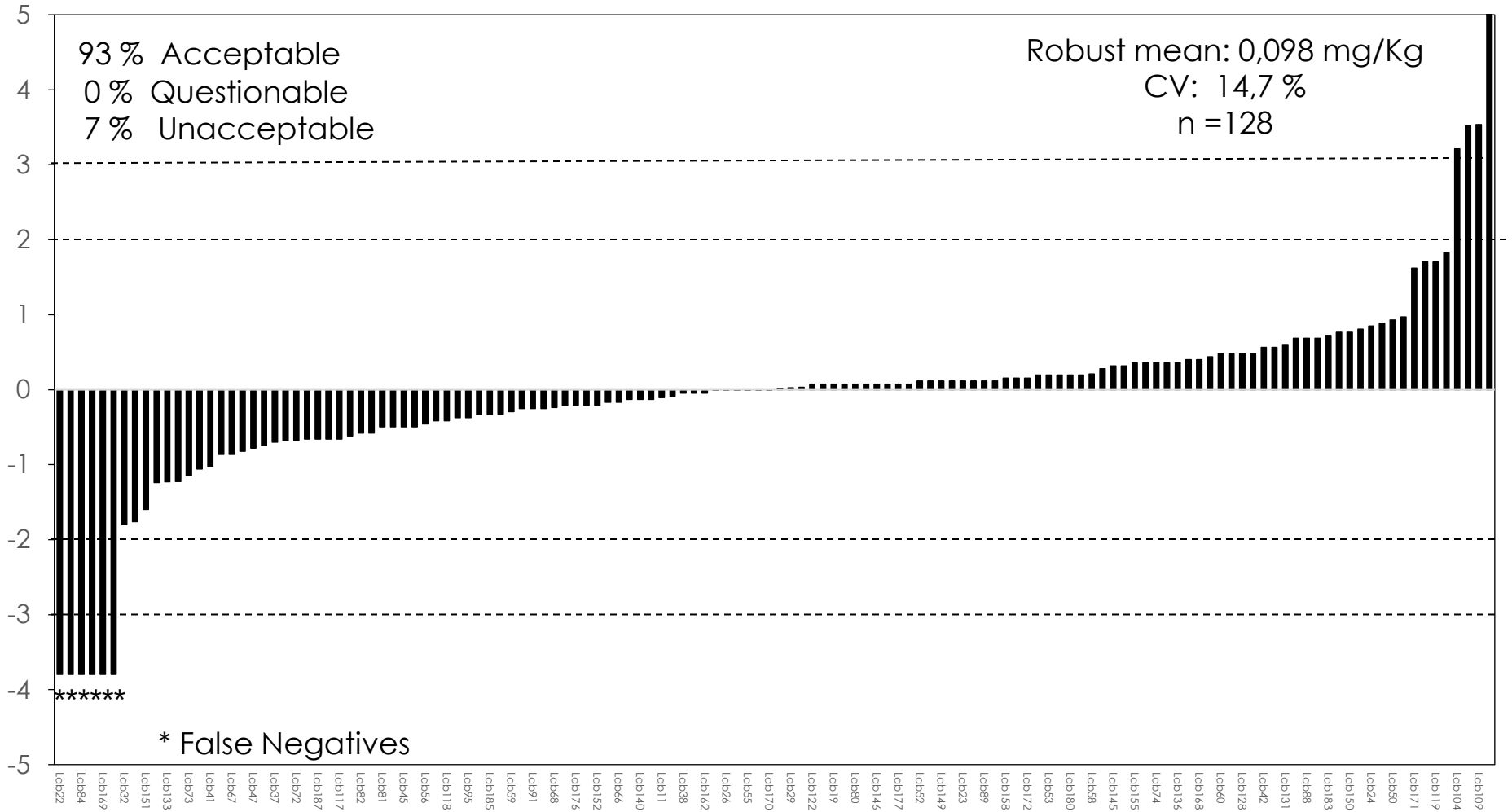
Oxamyl



EU/EFTA Laboratories

Spiked

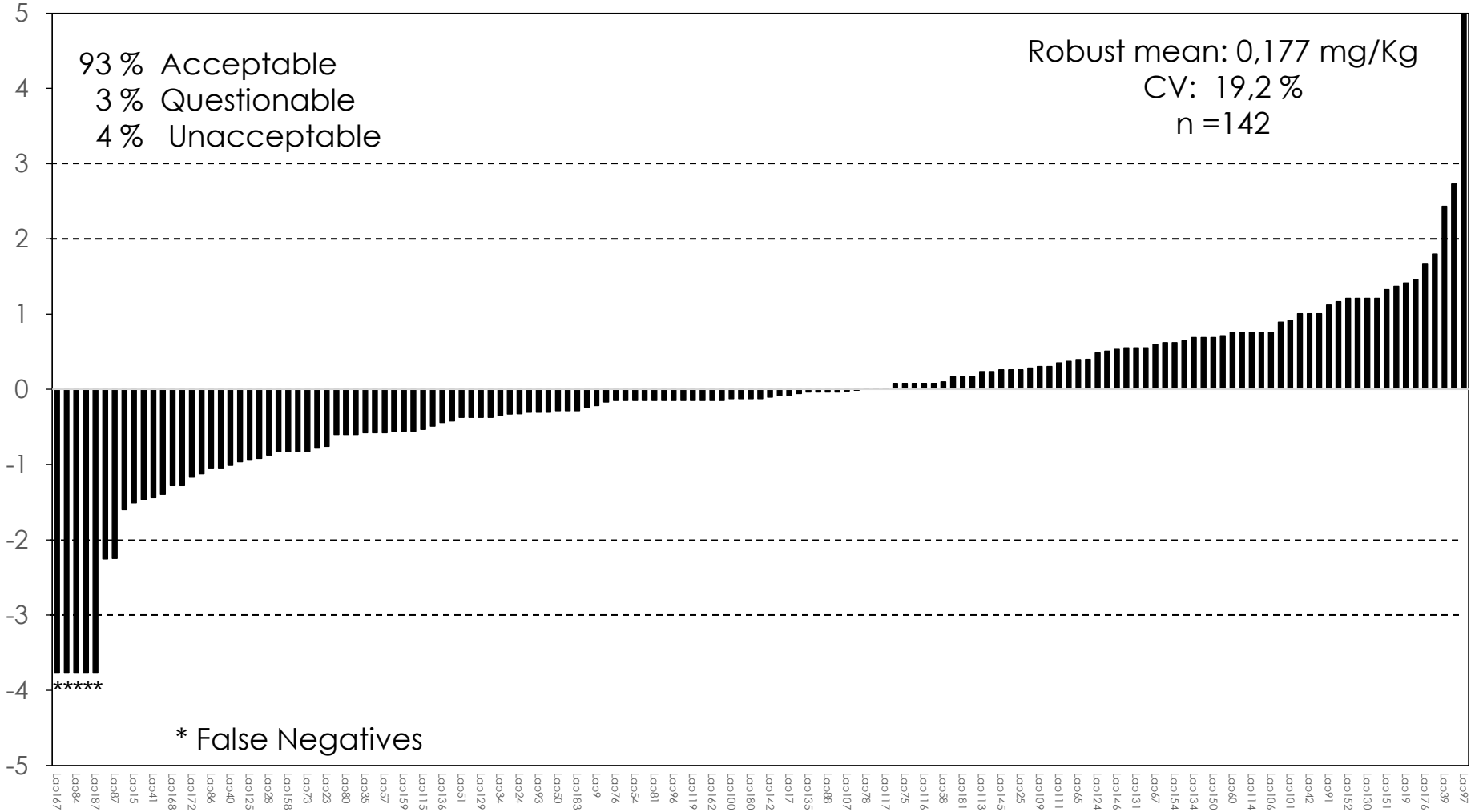
Oxydemeton-methyl



EU/EFTA Laboratories

Spiked

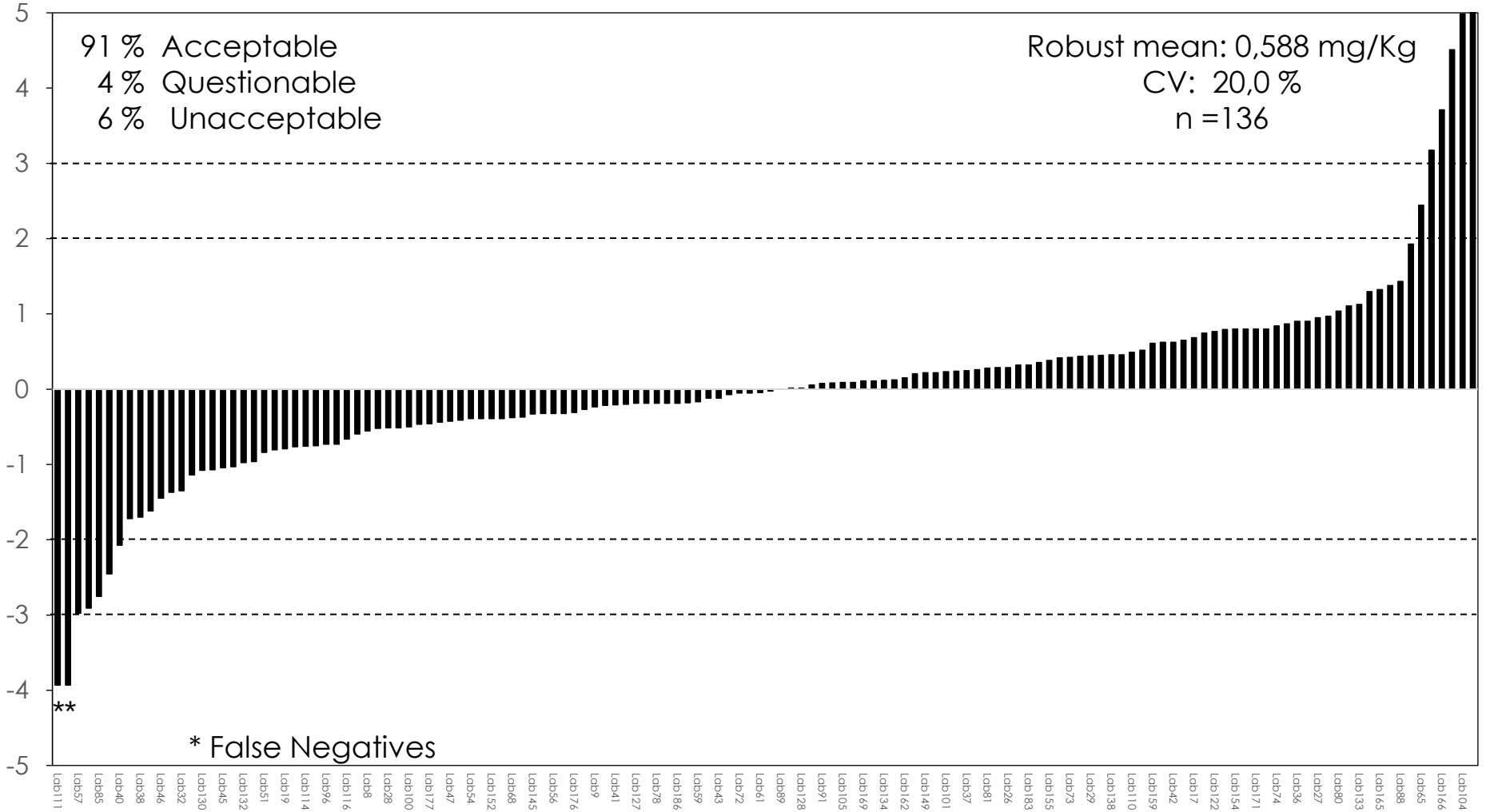
Procymidone



EU/EFTA Laboratories

Incurred

Propamocarb

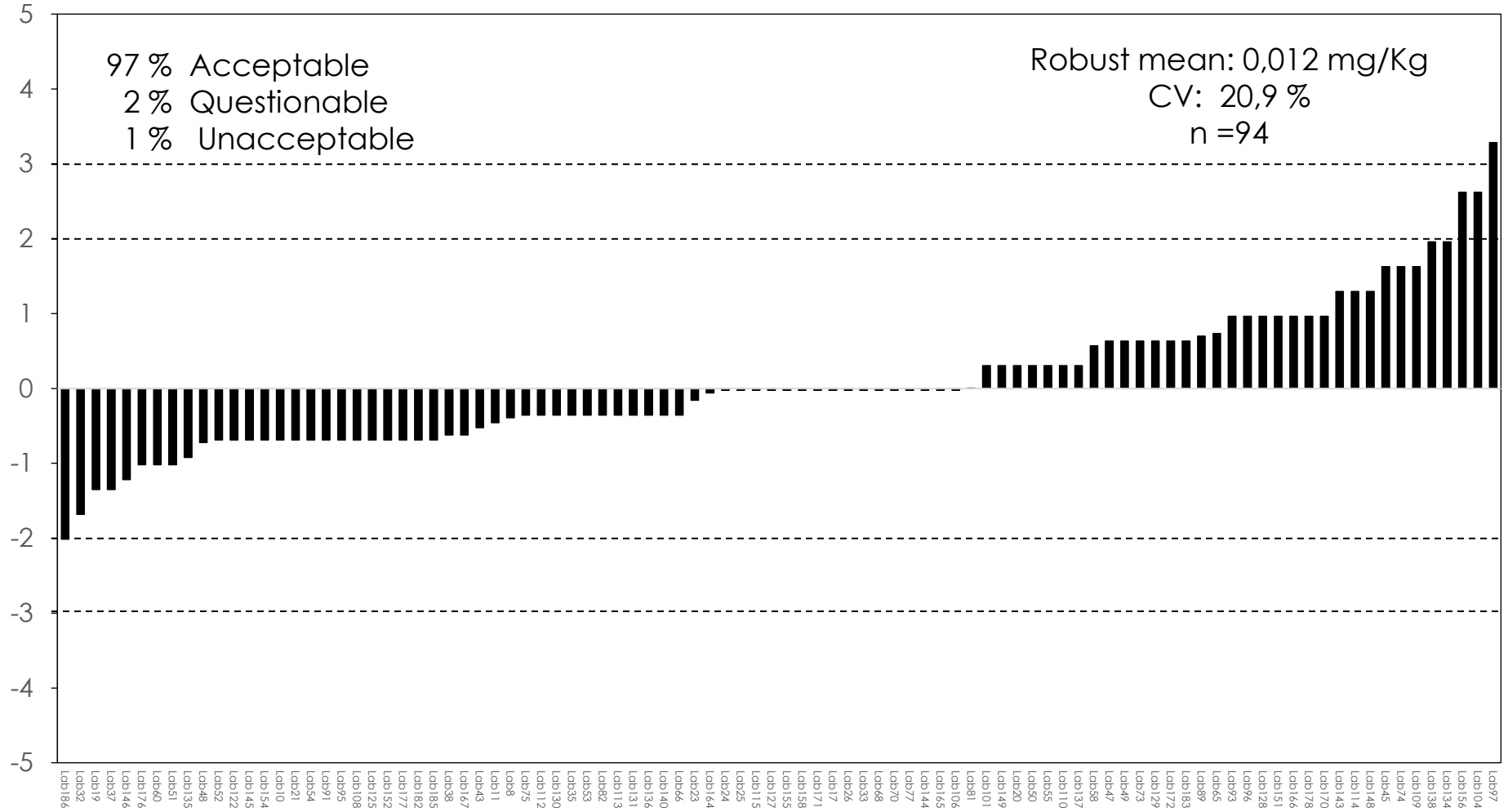


EU/EFTA Laboratories

Incurred

False negatives are not assesed
For informative purposes

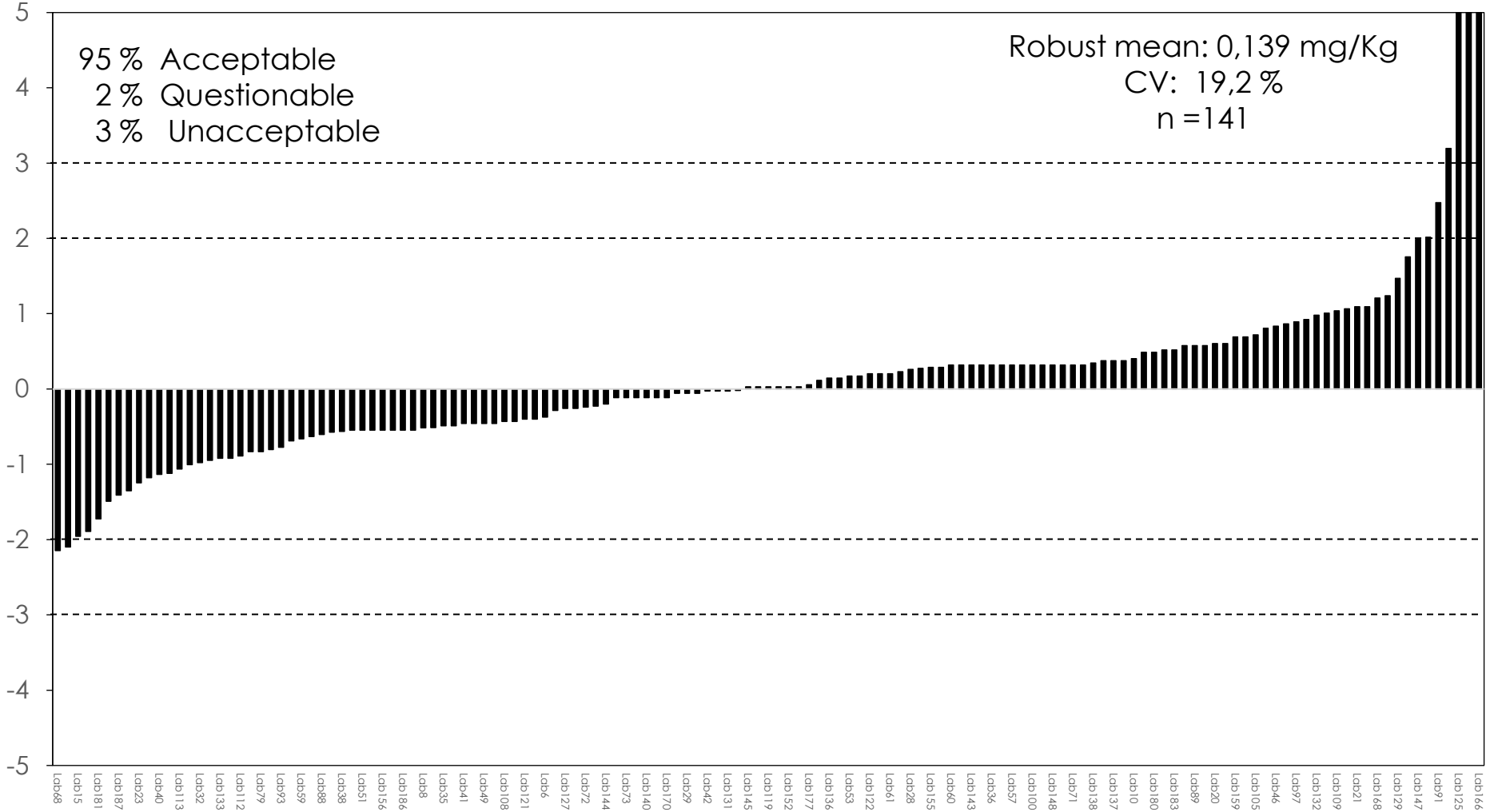
Pymetrozine



EU/EFTA Laboratories

Spiked

Spinosad (sum of spinosyn A and spinosyn D, expr. as spinosad)



EU/EFTA Laboratories

Spiked

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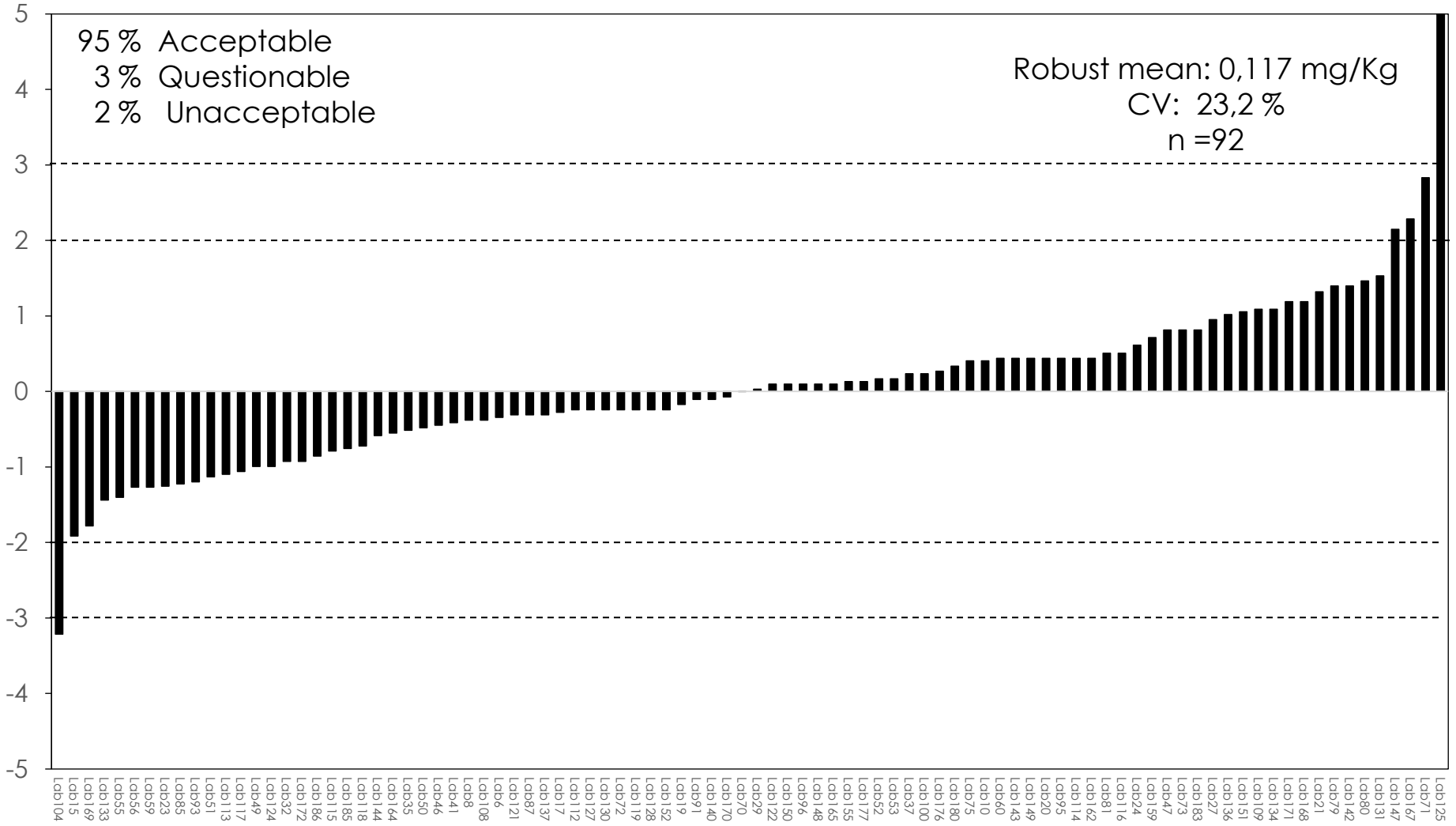
For informative purposes

Spinosyn A

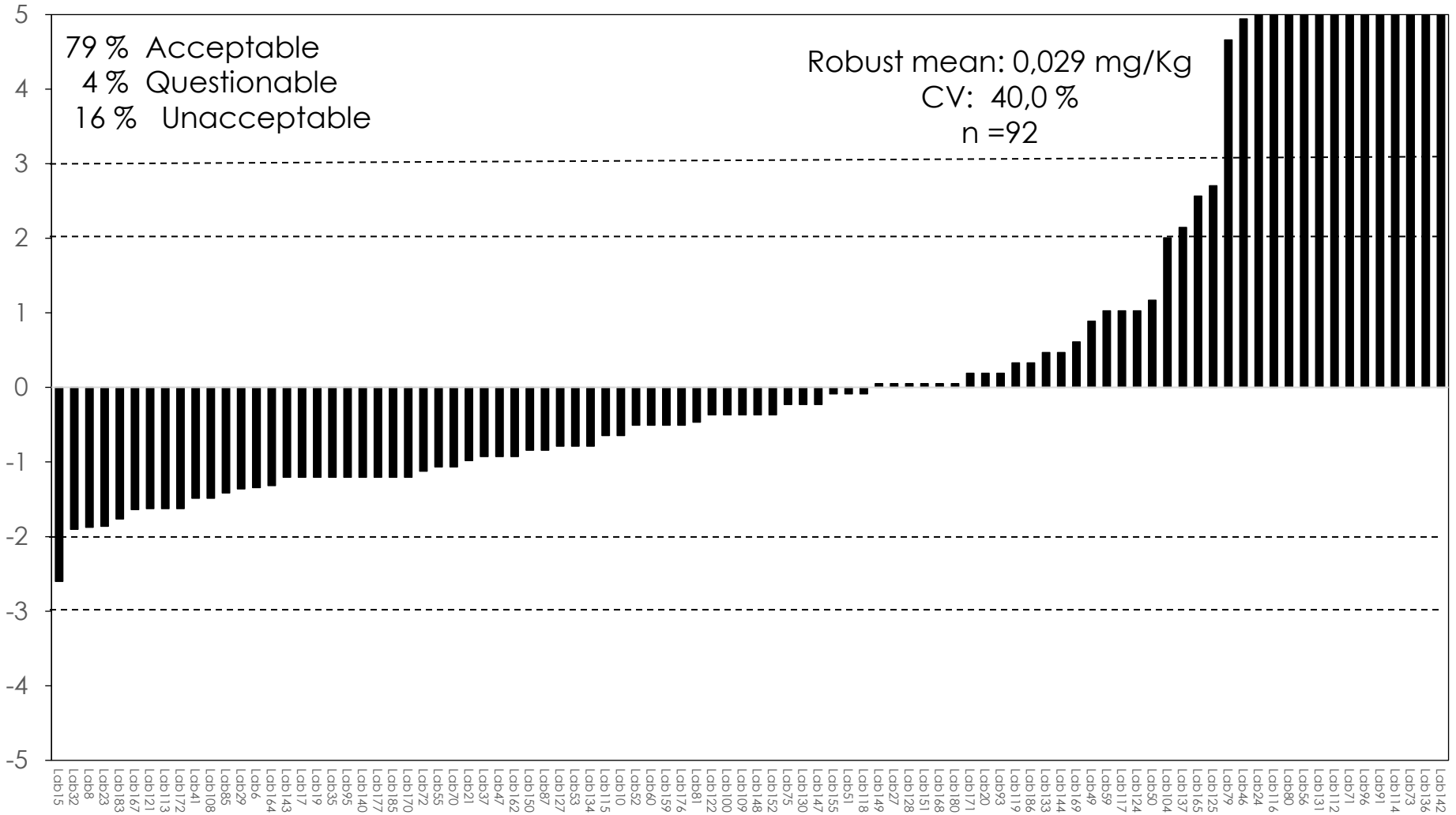


EU/EFTA Laboratories

Spiked

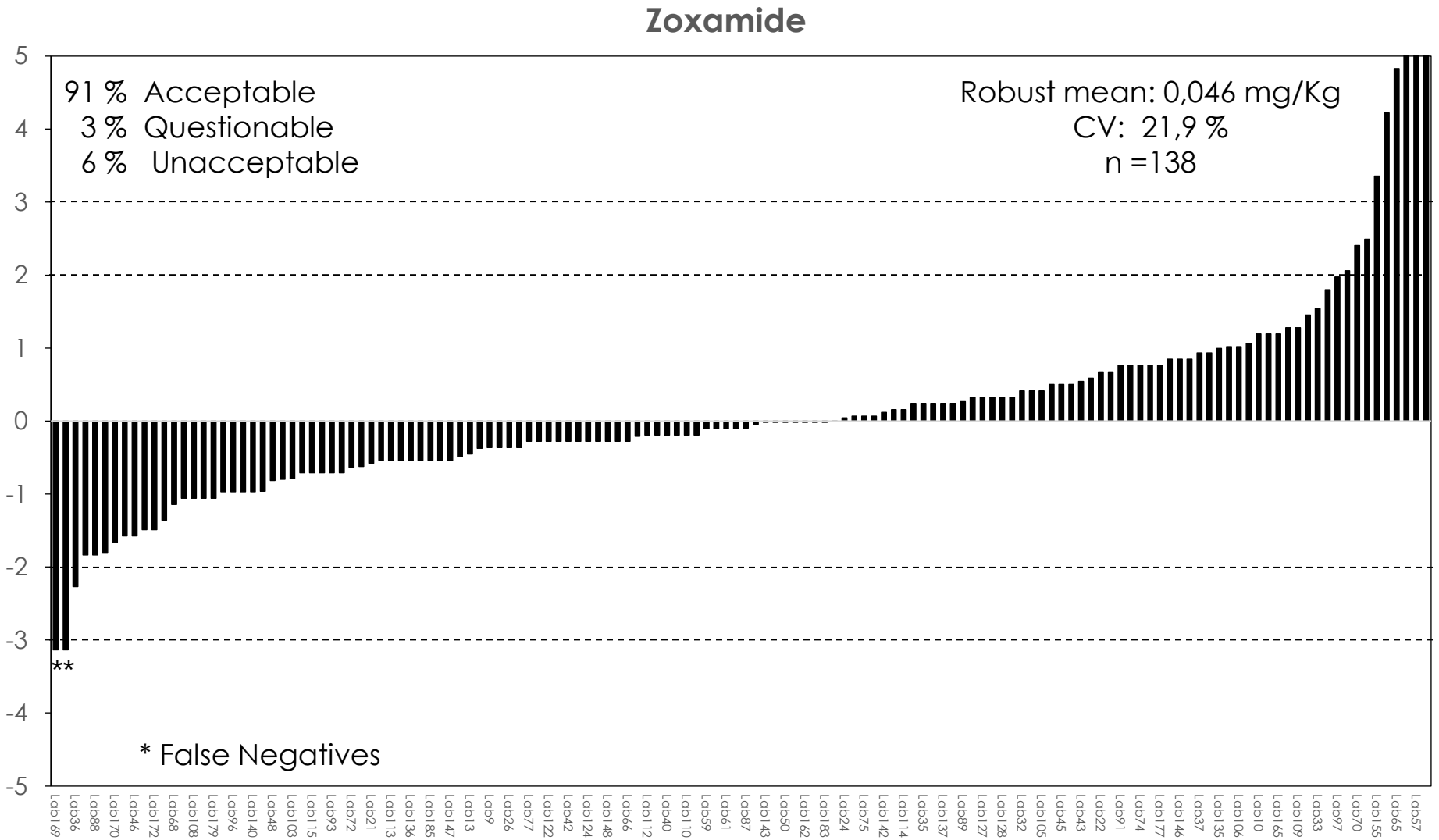
False negatives are not assesed
For informative purposes

Spinosyn D



EU/EFTA Laboratories

Spiked

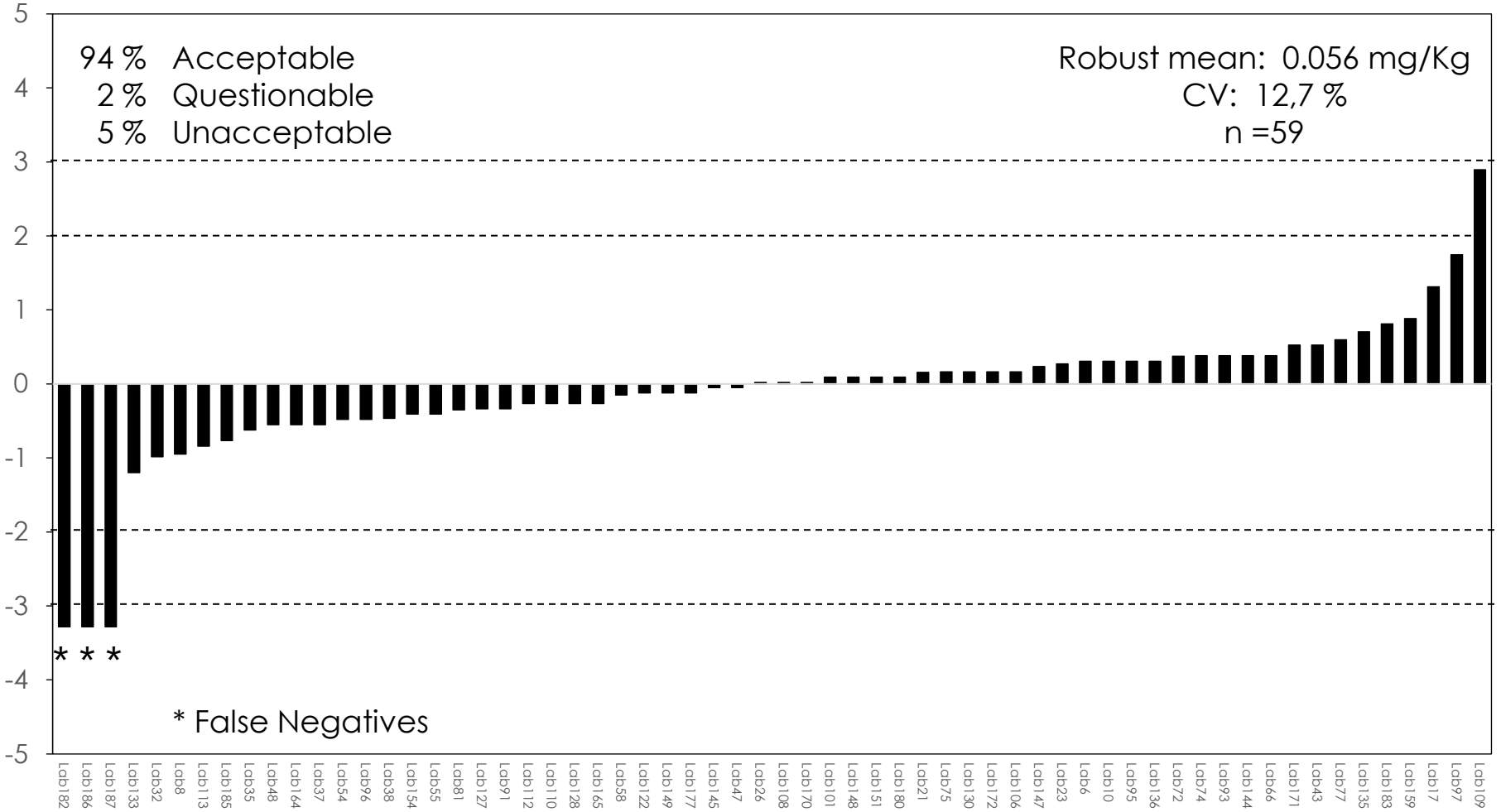


Voluntary Componds

EU/EFTA Laboratories

Spiked

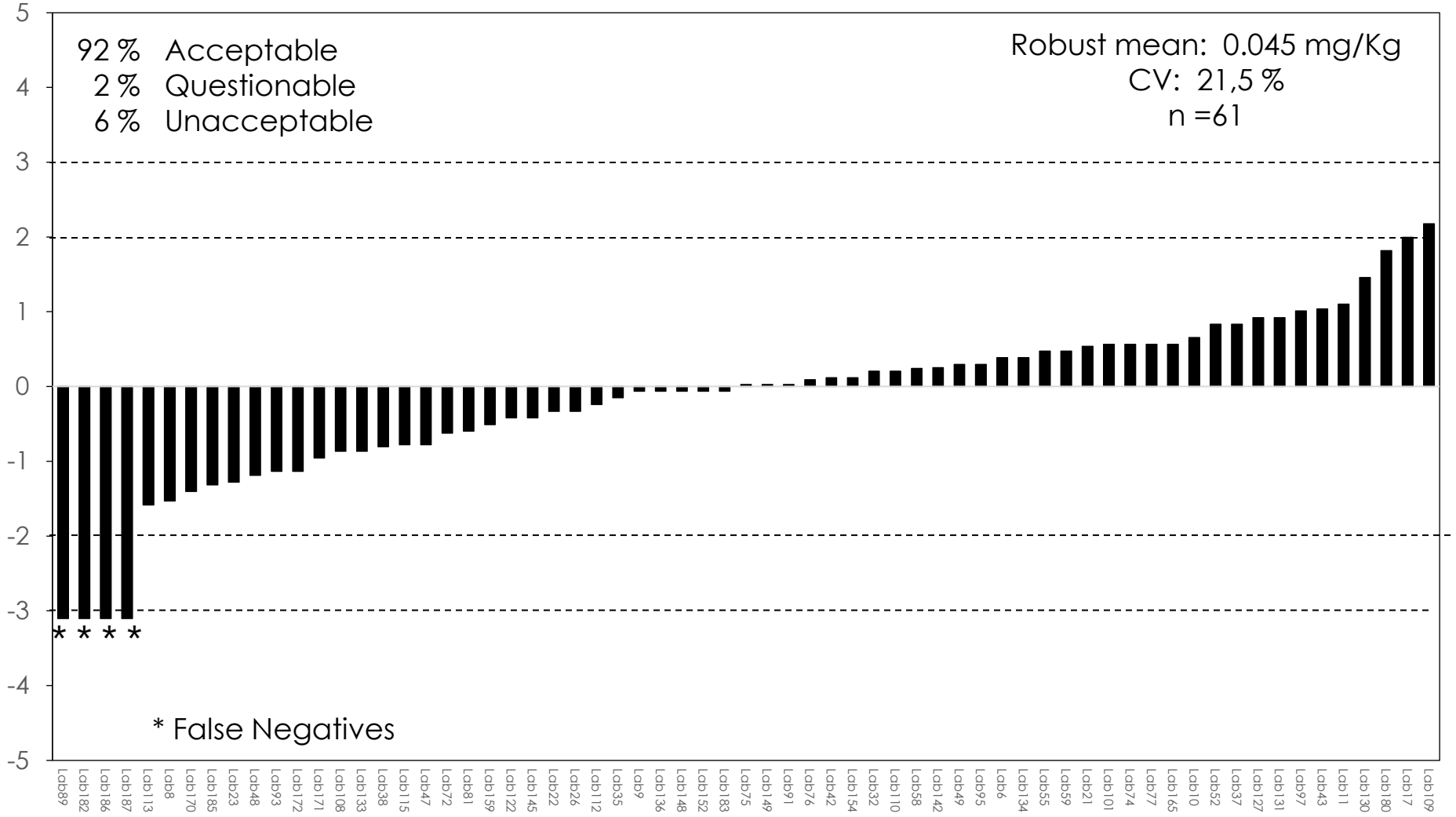
Flupyradifurone



EU/EFTA Laboratories

Spiked

Isofetamid



Average of Squared z-Scores

Category A

190

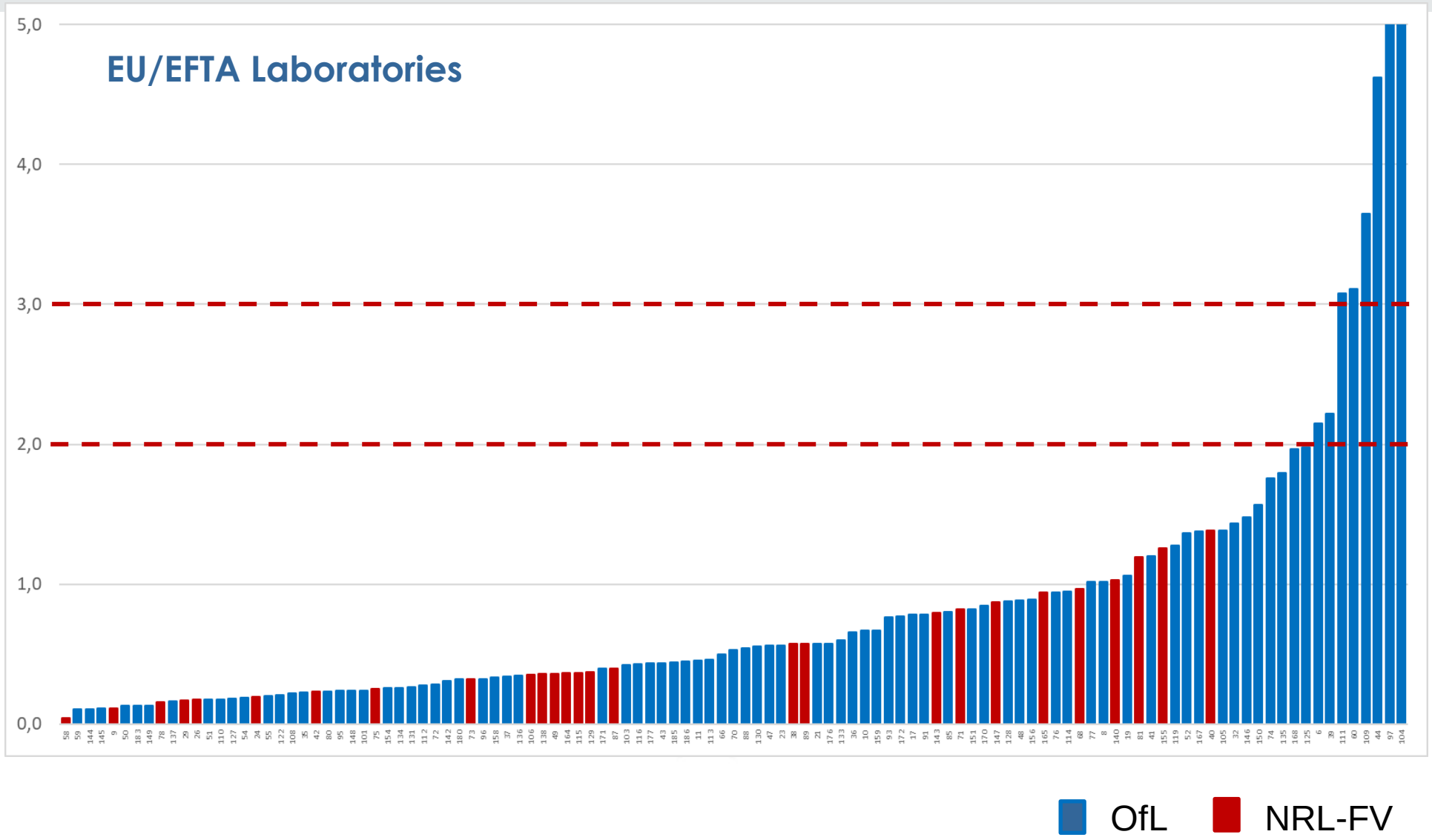
Laboratories that were able to analyse at least **90% of the compulsory pesticides in the target pesticides list**. that detected and quantified at least **90 % of the pesticides present in the Test Item** and reported **no false positives.**

14

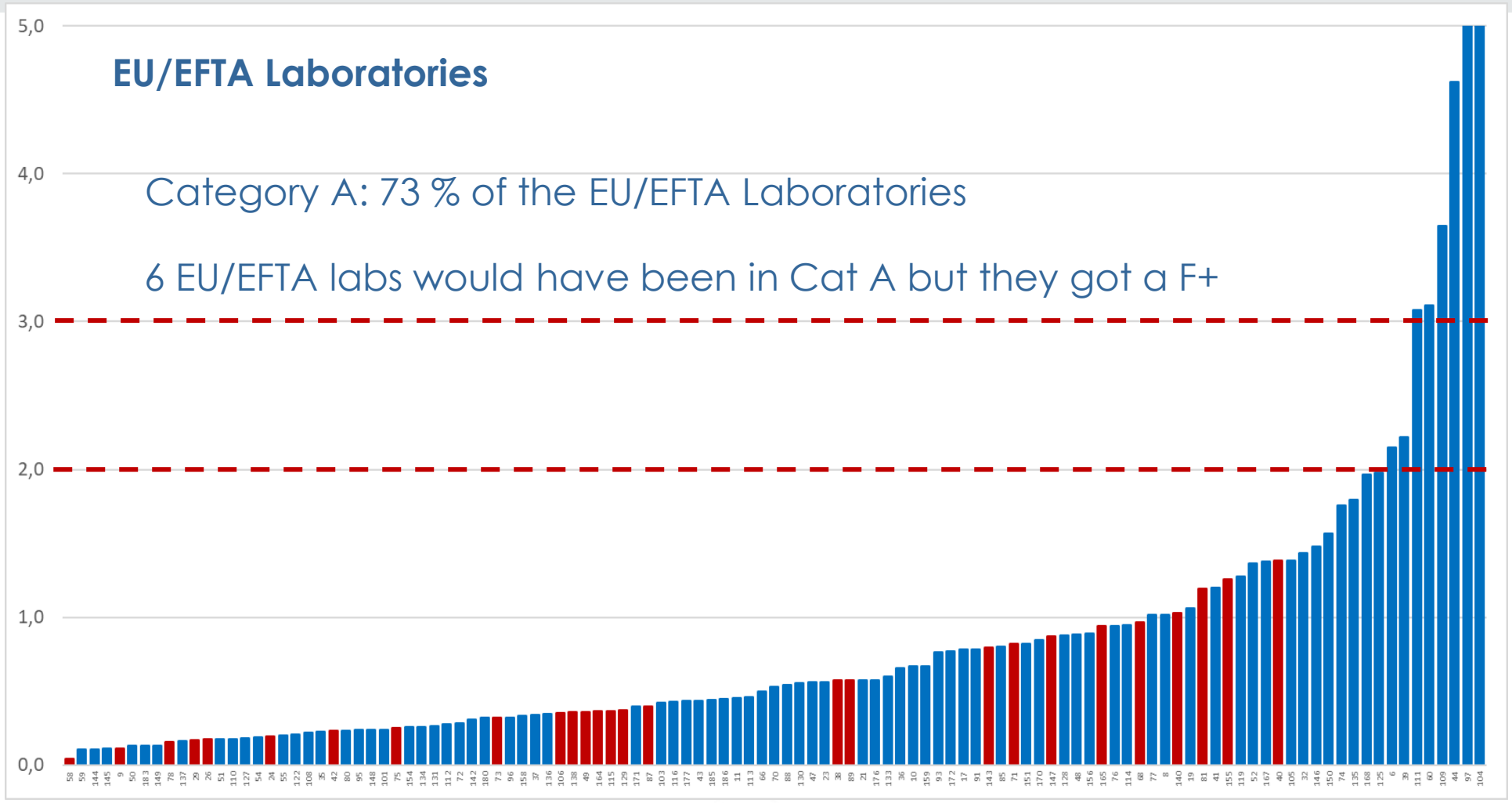
$$AZ^2 = \frac{\sum_{i=1}^{n} Z_i^{\,2}}{n}$$

$AZ^2 \leq 2.0$ Good
$2.0 < AZ^2 < 3.0$ Satisfactory
$AZ^2 \geq 3.0$ Unsatisfactory

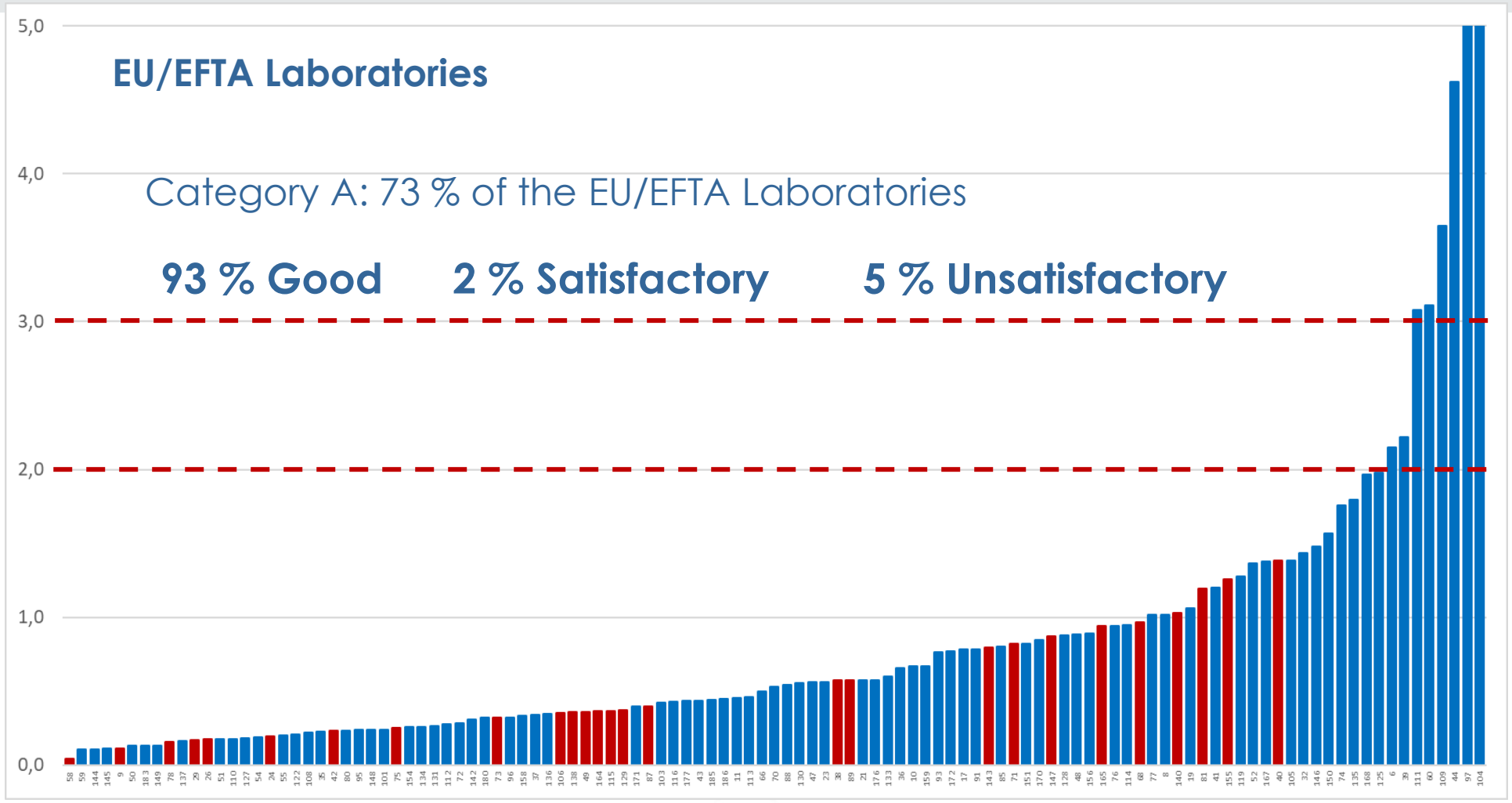
Category A Clasification



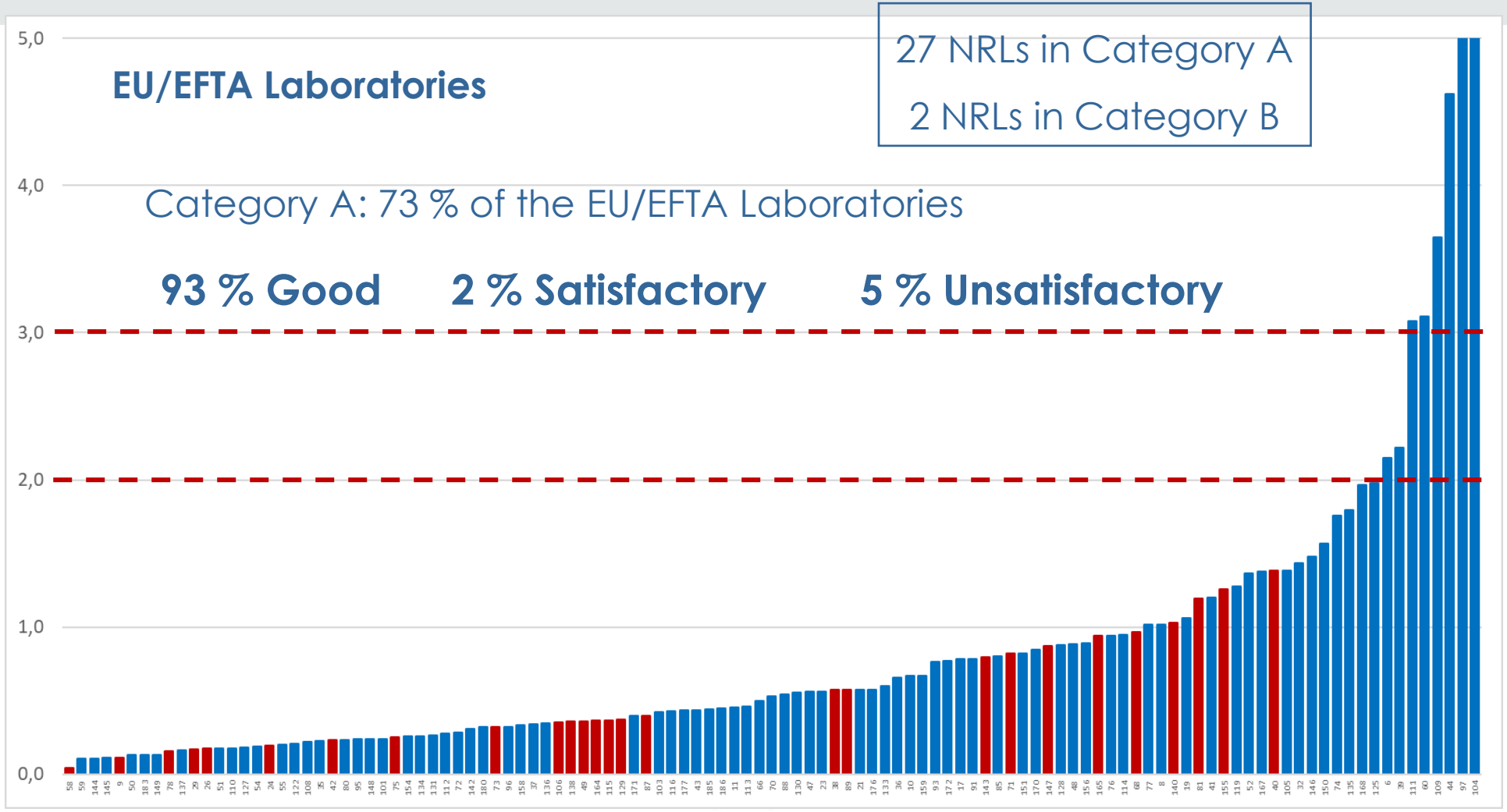
Category A Clasification



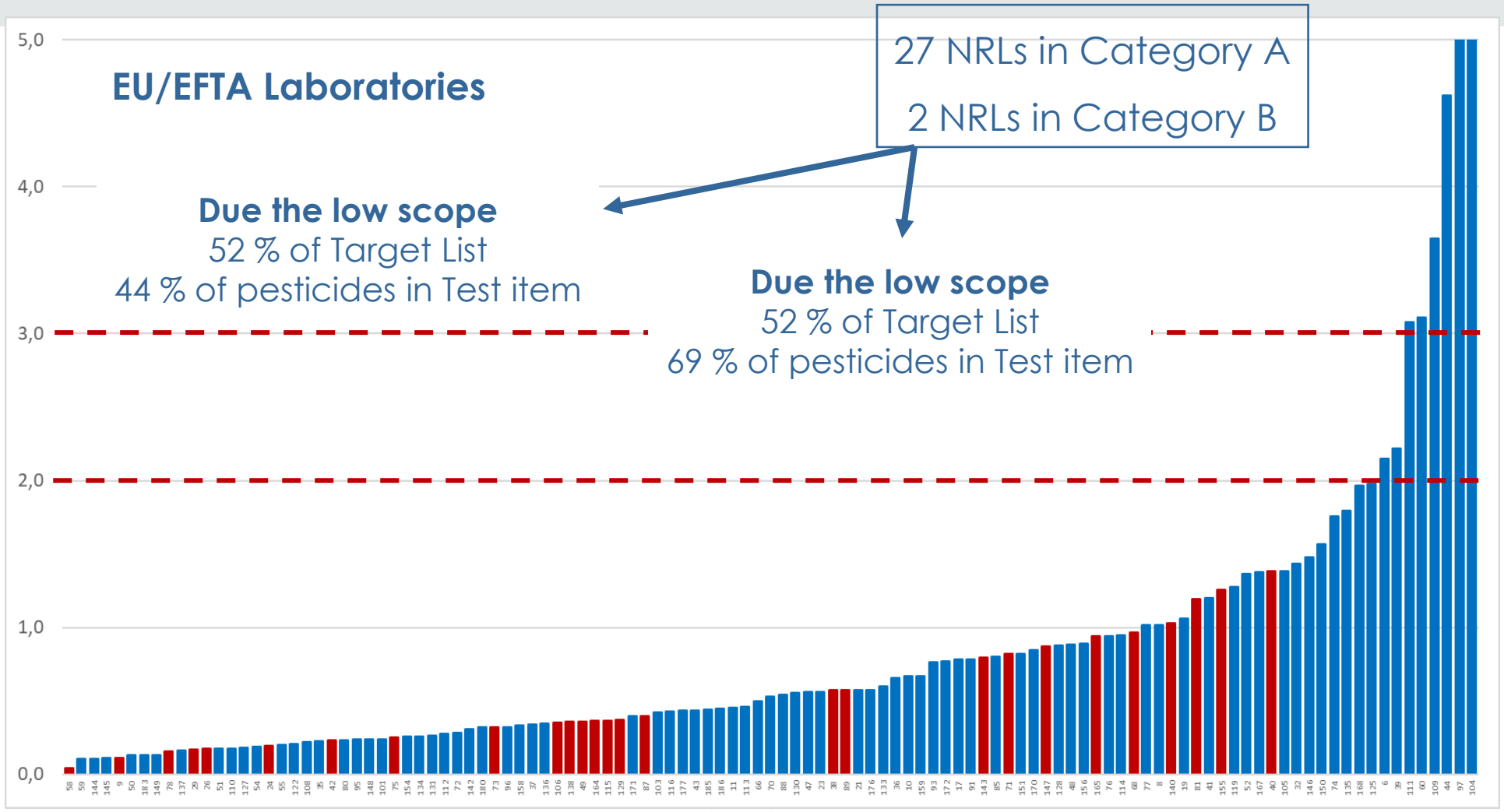
Category A Clasification



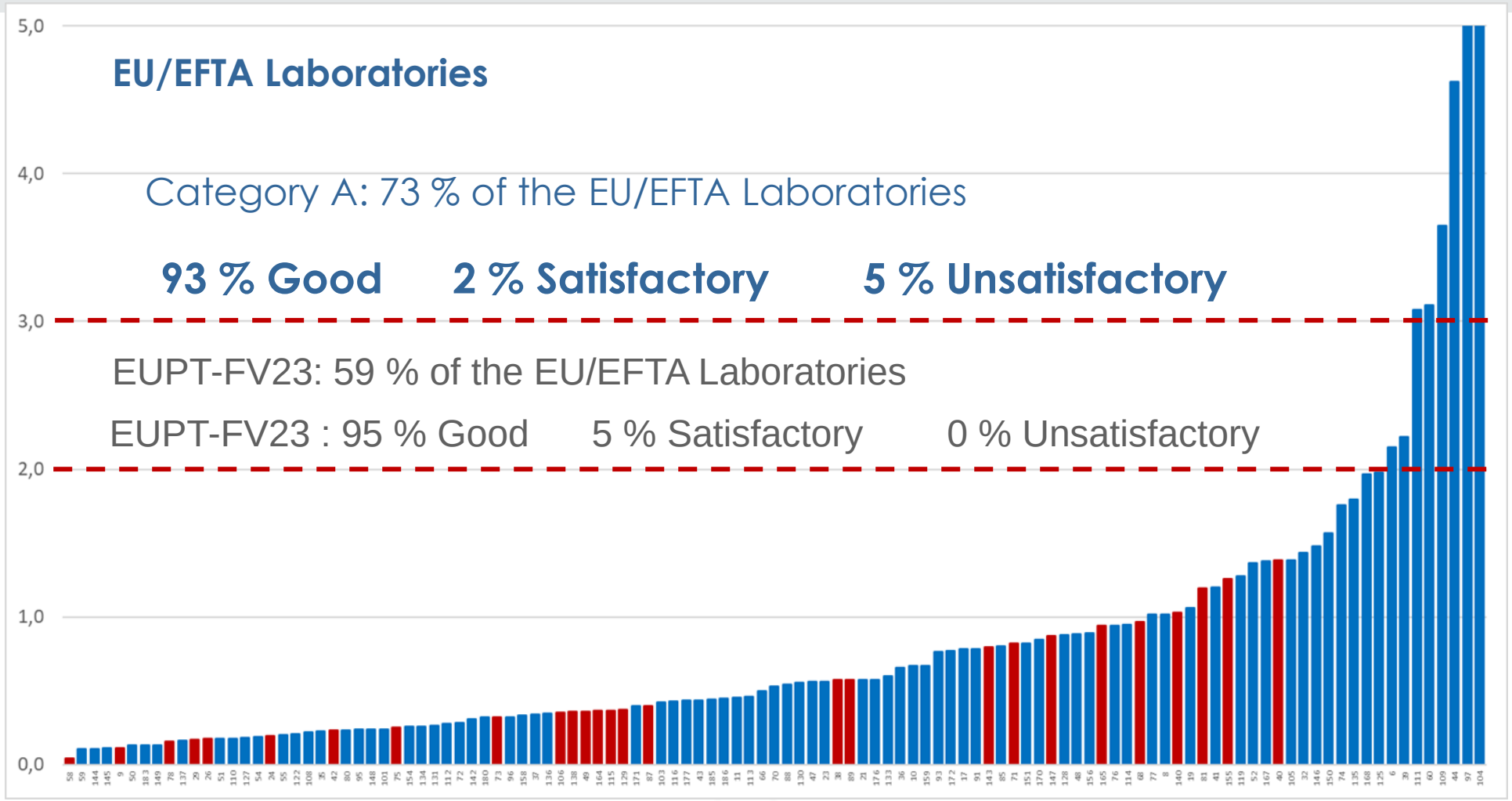
Category A Clasification



Category A Clasification



Category A Clasification



THANK YOU

FOR YOUR ATTENTION